ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

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ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

LIST OF MEMBERS OF THE ROYAL COMMISSION.

Commissioners appointed by Royal Warrant dated 1st July, 1901:—

The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman).
The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.
The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert.
The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.
Sir RICHARD CLAVERHOUSE JEBB, LITT. D., LL.D., D.C.L., M.P.
Professor S. H. BUTCHER, LITT. D., LL.D.
Professor J. A. EWING, M.A., LL.D., F.R.S.
Professor RÜCKER, D.SC., LL.D., F.R.S. (Resigned).
Professor JOHN RHŶS, M.A., D. LITT.
Professor J. LORRAIN SMITH, M.A., M.D.
WILLIAM J. M. STARKIE, ESQ., LITT. D.
WILFRID WARD, ESQ., B.A.

Commissioner appointed by further Royal Warrant dated 23rd July, in room of Professor Rücker, resigned:—

Rev. Professor R. H. F. DICKEY, M.A., D.D.

Secretary—

JAMES DERMOT DALY, M.A.

TERMS OF REFERENCE.

"To inquire into the present condition of the higher, general and technical education available in "Ireland outside Trinity College, Dublin, and to report as to what reforms, if any, are desirable in order "to render that education adequate to the needs of the Irish people."

ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

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ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

SECOND SESSION.

MINUTES OF EVIDENCE.

TENTH DAY.

TUESDAY, NOVEMBER 26TH, 1901,

AT 11 O'CLOCK, A.M.,

At the Royal University of Ireland, Earlsfort-terrace, Dublin.

DUBLIN.
Nov. 26, 1901.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT.D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

Mr. Justice MADDEN.—At the ensuing sittings of the Commission, we propose to take evidence on one branch only of our inquiry, that which relates to Technical Education. Technical Education, in its widest sense, is defined by the Act of 1889 as instruction in the principles of Science and Art applicable to industry, and in the application of special branches of Science and Art to specific industries or employments. But, for the purposes of our inquiry, it is limited to Technical Education in its relation to education of a University type, and we are not concerned with other branches of Technical Education except in so far as they may be regarded as leading up to or co-ordinated with University Education. We propose to take evidence as to the existing provisions for Technical Education, thus understood, in Ireland and in other countries, and to receive suggestions as to the development or improvement of our institutions, and we shall commence with witnesses who are in a position to give us information as to the existing condition of things in this country.

T. P. GILL, Esq., Secretary of the Department of Agriculture and Technical Instruction for Ireland, examined. T. P. Gill, Esq.

3939. Mr. Justice MADDEN.—Mr Gill, you hold the position of Secretary of the Department of Agriculture and Technical Instruction for Ireland?—Yes.

3940. That Department was established, as we know, by an Act of Parliament passed in the year 1899*?—Yes.

3941. Before we proceed further, Mr. Gill, it would be desirable to have from you, as representing the Department, a statement of the different Boards constituting that Department, and of their several functions. We shall be obliged if you will go into the matter rather fully, for while some of us here may be familiar with the facts, it is desirable to have them on record for the benefit of the Commissioners in Great Britain?—Very good. I had intended dealing only with the educational work of the Department; as you wish, I shall be glad to give you an account of its constitution. In that case, perhaps, I might begin by explaining that the Department is the direct outcome of the Report of the "Recess Committee,"† of which, I think, the Commissioners have copies, and that the constitution outlined in that Report (except for the differences due to the passing of the Local Government Act since it was issued), and the purposes which the Department it proposed was intended to fulfil, are, roughly, the constitution of the Department, and the purposes which it is now undertaking to carry into effect. I mention that fact because that Report gives as good a notion of the work and the functions and the purposes of the Department as perhaps any other publication, and because the chief officials of the Department were the Chairman and the Secretary of that Recess Committee, and they have been appointed to put into practice, so far as it can be done, the ideas which the Recess Committee agreed in formulating. Our first Annual General Report of the Department, moreover, will be issued in a day or two, and that covers the whole of this ground of the Department's constitution, and any point I may omit in my summary you will find there. The constitution, then, includes a central authority, intended to be representative at once of the Crown, of the recently-created local governing bodies of the country, and of those classes of the people with whom the work of the Department is chiefly concerned; and gives to this authority the function of aiding, improving, and developing agriculture, fisheries, and other industries of Ireland in so far as may be proper for such a Department, and in such a manner as to strengthen and stimulate the self-reliance of the people. That is mainly the idea of the Department. The Department is, so to speak, the executive part of the constitution. For its agricultural work and general industrial work, its funds are controlled by an Advisory Board, which is constituted in the following manner:—The County Councils of the country elect, each of them, two members of a Council of Agriculture, and the Department nominates one member for each of those two. That body—the Council of Agriculture—elects for each province two members to sit on the Agricultural Board, making eight members, and the Department nominates four more. That is the Agricultural Board. The concurrence of that Board is necessary in all expenditure by the Department from what is called the surplus portion of the Endowment Fund—that is, that portion intended for the promotion of agriculture, rural industries, fisheries, and any technical instruction that may be necessary for those purposes.

* See page 227.

† Report of the Recess Committee on the Establishment of a Department of Agriculture and Industries for Ireland, with Appendices. Second Edition. Dublin, Browne and Nolan, 1896.

DUBLIN. *Nov.* 26, 1901. T. P. Gill, Esq.

3942. Most Rev. Dr. HEALY—Inland fisheries?—Both sea and inland fisheries. There is a sum of £10,000 specially set aside for sea fisheries, which the Department can administer without the concurrence of the Agricultural Board—but in practice, as your lordship is aware, the Department consults the Board about that expenditure also. Now, for the purpose of administering the fund of £55,000 for technical instruction, there is another Board, called the Board of Technical Instruction, of which Dr. Starkie is a member. That Board is constituted in the following manner: Three persons are appointed by the County Council of each of the County Boroughs of Dublin and Belfast, one person by a Joint Committee of the Councils of the several urban county districts of the County Dublin, one person by the Council of each county borough other than Dublin and Belfast, one person appointed by the Provincial Committee of each province (that Provincial Committee means the section of the members of the Agricultural Council, to which I have referred, who belong to a particular province: they nominate one member to this Board); one person appointed by the Commissioners of National Education, one by the Intermediate Education Board, and four appointed by the Department. That is the Board of Technical Instruction. That deals with the endowment of £55,000 in somewhat the same manner, though not quite in the same manner, as the Agricultural Board deals with the surplus. The main difference is this: that the six county boroughs in Ireland have out of the £55,000 each a sum ear-marked for them which is intended to be in proportion to population. This Board settles that amount every three years. That sum, once it is divided in that manner, passes, for the time being, from the jurisdiction of the Technical Instruction Board, and is administered by the county boroughs, subject only to the approval of the Department. The six boroughs of Dublin, Belfast, Cork, Waterford, Londonderry, and Limerick, have each a sum ear-marked for them in that way, which the local authority there administers for schemes of which the Department approves. The remainder of the sum of £55,000 is administered by the Department for the rest of the country, for the purposes of technical instruction of an industrial character, with the concurrence of the Technical Instruction Board. That, in outline, is the constitution of these two Boards. There is one other statutory body connected with the Department; that is the Consultative Committee of Education. This is a Committee appointed for the purpose of facilitating co-ordination between the different educational authorities of the country. It consists of one person appointed by each of the following bodies, viz., the Commissioners of National Education, the Intermediate Education Board, the Agricultural Board, and the Board of Technical Instruction, with the Vice-President of the Department as *ex-officio* Chairman. The members of that Board are the Vice-President, the Most Rev. Dr. Walsh (Archbishop of Dublin), Dr. Starkie, Dr. Todd-Martin, and myself. These are the bodies with which the Department has to work according to its constitution. But a general principle of the Department, implied rather than expressed in its constitution, requires that it should also, so far as possible, enlist the local bodies of the country in its work. That is a point of great interest, and of peculiar interest in reference to education, because in this country, with the exception of the extent to which the Technical Instruction Acts of 1889 and 1891 were utilised, education has hitherto been carried on entirely without reference to local authorities. The local authorities had no power to raise rates except the 1*d.* in the £ they raised under the Technical Instruction Acts, and very few of them raised this rate. They can now raise another 1*d.* for education. It is still a limited sum (a curious limitation: abroad local authorities can tax themselves for education to any extent); but the point is, our Irish local bodies are now beginning to raise this rate. I think practically every local authority in Ireland—county council, urban district council, and county borough council—is raising a rate for educational purposes, as well as for the other purposes of our Act. That fact imports, to some extent, a new element into the educational system of the country. One of the great questions or problems of our administration will be how most usefully to avail ourselves of the co-operation of the local authorities in reference to our educational work. We have their co-operation in several branches of the Department's work, such as agricultural administration, live-stock schemes, and all that side, with which this Commission is not concerned. But in reference to education, the question is somewhat different. In England and Scotland the technical instruction money was given wholly to the local authorities, and, while very good work has been done by many of them, it is generally recognised in England now that the lack of central direction in this most important branch of administration, which, perhaps, more than any other, requires expert guidance, has been a great defect there. We are in a different position. Our Department in Ireland follows the Continental model, and is intended to supply, so far as our relations with schools, with local authorities, and with other local sources from which aid for education may be forthcoming, are concerned, this central direction which had been so lacking in the British system, and which has been found, on the Continent, to be the most effective of all means of getting an intelligent system of education, in technical matters, at any rate, into work. I think that is, broadly, all that it is necessary to say on the subject of the constitution of the Department. If there is any point I have not made clear, I shall be happy to answer further.

3943. Mr. Justice MADDEN.—Would you state to us the provisions made by the Act of 1899 and by your Department for Technical Education in Ireland, bearing in mind that we are dealing with the question in its relation to University Education?—Yes.

3944. We do not mean to exclude any branch of the subject which might be considered as leading up to or connected with University Education?—Yes, I understand, and on that point I may say that the Department is very strongly convinced that it is necessary, in this matter of Technical Education, to have regard to the educational system of the country as a whole, and to bear in mind at every step its relations with both the primary and the secondary grades of general education, and also with the higher grades of education, whether in Technical Colleges or in Universities. The educational functions of the Department include the administration of certain funds which were formerly administered by the Department of Science and Art at South Kensington, now called the Board of Education. The more important of these funds is the grant for Science and Art. That grant is an elastic Parliamentary grant, the amount of which depends upon the extent to which it is utilised by the schools taking up the subject to which it applies. The next fund is the equivalent grant under the old Technical Instruction Acts of 1889 and 1891. These were Acts which enabled the local authorities to raise a rate for the purposes of technical instruction, and which authorised the South Kensington Department to make an equivalent grant to the amount of the rate so raised for that purpose. Those Acts, and the grants for Science and Art, are now administered by our Department. In addition, there is the special endowment of the Department itself for the purpose of technical instruction. That includes an annual sum of £55,000 for the purpose of technical instruction in non-agricultural subjects, to which I have already referred. It includes, also, so much of the surplus of about £100,000 which is administered by the Agricultural Board for the general purposes of agriculture, rural industries, and fisheries—so much of that surplus as that Board may think it right to set aside for technical instruction relating to agriculture—agricultural instruction. These are the three main heads under which the Department has to deal with education. I should point out, also, that formerly the Commissioners of National Education in Ireland dealt with a certain proportion of agricultural education, which was the remnant of an old system that that Department originally proceeded to organise, but which, from various causes, it found it necessary, more or less, to abandon. The powers and duties of the Commissioners that we have taken over relate principally to the establishments known as the Munster Institute, in Cork, and the Albert Model Farm, Glasnevin. The money that was administered by the National Board for that purpose goes into our surplus that I referred to just now. I should also point out that the powers and duties of the South Kensington Department that we have taken over include, besides the administration of the Science and Art grants in schools, the administration of what are called the Science and Art Institutions in Ireland, *i.e.*, the Royal College of Science, the Museum of Science and Art, the Metropolitan School of Art, the National Library of Ireland, and the Botanic Gardens at Glasnevin. All of these institutions may be considered as having more or less direct relation with the higher grades of technical instruction.

3945. And as connected with our inquiry?—Yes. That, perhaps, is the answer to your question. If you would like me to go on——

3946. Go on, if you have anything further to add from your knowledge of the character and working of the Department—with regard to the particular question as to what provision has been made. Does what you have stated exhaust the provision for technical instruction with which your Department has to deal?—Yes, that practically summarises the provision for technical instruction. The Science and Art grants are an indirect part of technical instruction, but they are also a more direct part of general Secondary Education.

3947. Perhaps you will tell us what part of your Department is supplied with funds out of what you have called an elastic grant—by which you mean moneys annually voted by Parliament?—Yes, I will do that.

3948. That applies to the entire of the Science and Art Department, does it not?—Yes, to the grants that are given to schools for subjects under the general denomination of Science and Art.

3949. Yes?—Under that head the Department have introduced a new programme for Secondary day schools, in co-operation with the Intermediate Board.

3950. Perhaps you will explain that programme, and its relation to the Intermediate Board?—Yes, with pleasure. That step, I think, during the time the Department has been in existence, is the most important it has been able to take. This is a grant which brings us in most direct relation with general Secondary Education.

3951. We are not inquiring into Secondary Education as such, or into the Intermediate system, or into the relations between the Intermediate system and your Department; but I understand that you wish to deal with that branch of the subject as leading up to and co-ordinated with University Education?—Quite so.

3952. The mere details of the arrangements with the Intermediate Board would hardly be within our province; but you can exercise your own discretion in the matter?—I should not go into this, except with the view of pointing out how essentially bound up it is with the whole question.

3953. That is quite within our province. Do not restrict yourself, but bear in mind the direct object of our inquiry?—Yes. I was pointing out that this brings us into more direct relation with general Secondary Education than our other functions do, and the Department feel themselves bound to look at this question primarily from the point of view of general education, secondarily, from that of the specialisation in certain directions to which we hope the Secondary Schools will lead. Their programme of Experimental Science and Drawing and Manual Instruction in its first two years is meant to give a minimum of scientific discipline and training of the hand and eye, which might form part of a general curriculum, without any injury to the essential function of the humanities in the Secondary school. The Department desire to be very clear about that. They think a liberal introduction to general culture is an essential foundation to all properly conceived specialised instruction; and Science and Art cannot be a substitute for humane letters in such a general course. It can be a powerful ally, but not a substitute. We do not want to see Ireland, when she is reforming her system, falling into the mistake which is being repented of elsewhere—that of under-estimating the human and ethical parts of education, even for distinctly practical purposes. That, perhaps, one ought to make clear—I mean that these considerations are borne in mind when a great effort is being made to give emphasis to Science, and to use the Science and Art grants for their special purpose, that of encouraging Science and Art instruction. Both of these subjects underlie practical and technical instruction of almost every kind. Now, the situation which we found, on taking over this branch of our work, was that Science education in Ireland, during the last fifteen or sixteen years, had been subjected to an extraordinary depression. This hit us at once from the bottom up to the University grade of education; for, to introduce our Science course into the schools, qualified teachers were necessary, and, as the schools during these years had not been sending up pupils pursuing Science to the Universities, or to the Royal College of Science, the supply of qualified Science teachers was not there. Here is a striking fact. In the year 1891 the amount of the Science and Art grants earned in Ireland was £8,481. That was a rather small amount, compared with England and Scotland; but nevertheless, it was, as you will see, more than twice the amount which was earned in Ireland from these grants in 1898, the last year for which I can get the figures; the amount in that year was £4,081. In the year 1891, to which the first figure relates, the Intermediate Board received the Residue Grant—the £47,000; and the interest of that fact is that the rapid decline of Science instruction in Ireland began with that year. In the year 1891 the number of boys presented for Natural Science under the Intermediate Board was 2,885. That figure had sunk, in the year 1899, down to 673, which was less than one-fourth of the previous number. In the same period the total number of boys presented for all subjects under the Intermediate increased from 3,856 to 6,146, that is, nearly doubled. So that the influence of the Residue Grant on the Intermediate system was—that while it doubled the total number of pupils going in for the Intermediate courses, it reduced to one-fourth the number of pupils who had been taking up Natural Science. That is a most remarkable fact, and one very important to bear in mind, because the effect of that money was simply to blight Science teaching in Ireland.

3954. Do you suggest any cause for that?—I think the cause is well brought out by the evidence given before the Intermediate Commission.

3955. That is the answer I expected. The encouragement held to masters of schools to develop what you might call the higher grammar school education, as compared with Practical Science and Technical Education, was so great that the latter was totally neglected?—Certainly. The position given to Science in the general curriculum of the Intermediate was such as did not make it worth the while of schoolmasters to take it up.

3956. Was there not another cause co-operating—the difficulty of obtaining sufficient local aid for the teaching of Science in schools?—In order to equip laboratories?

3957. Yes?—That might have been an item.

3958. I suppose you are aware that under the new system we are now empowered to equip schools with laboratories for the teaching of Practical Science?—Yes, I am aware you can give aid for this purpose.

3959. There is very little use in offering a grant for efficiency in Practical Science, unless you enable a schoolmaster, or the owner of a school, to provide the necessary equipment?—Quite so. And one of the steps which our Department have taken is to use a portion of our first year's technical instruction money—as distinct from the Science and Art Grants—to help Secondary day schools to put up a Science equipment which will enable them to begin to earn the Science and Art Grants.

3960. And there is a considerable sum at the disposal of the Intermediate Board for that purpose?—Yes; you can lend money to the schools for that purpose.

3961. To sum up the two causes: first, there were greater inducements held out to develop a different type of education?—Yes, the literary education.

3962. And secondly, the absence of the necessary equipment, and, in some cases, the means of obtaining it. It is very expensive?—Yes; I would not like, however, to say that the latter was a very powerful operating cause against the teaching of Science, although, no doubt, it counts for something, because, you see, the use of the Science and Art Grants in Ireland had been increasing up to 1891, and in England and Scotland their use has been increasing. And, moreover, the Science and Art Department had, and we have now, a power of making a grant towards equipment and apparatus. Half the amount, roughly speaking, can be given.

3963. Yes, I am aware of that?—So that I would not like to lay much stress on that second cause. I think that if the way had been prepared otherwise, that cause would not have operated so very badly. The importance of that state of things from our point of view, in the interests of technical and agricultural instruction, and in the interests of general practical education in the country, is this—that the soil, so to speak, for practical instruction in Ireland, has been impoverished to an extraordinary degree. For years there was practically no teaching of Science, and Drawing; and there has been no corps of teachers prepared. If anything, there would be a justification now for the schools making rather an error in the opposite direction, and over-emphasising Science teaching for a

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while. I do not think that that over-emphasis will be a necessary result of present reforms; but still, it is worth bearing in mind that there is a balance needing to be redressed. Unless an adequate and rightly conceived system of Science and Art instruction is established in the day schools of Ireland, technical instruction will have no real basis to go upon—especially the higher grades of technical instruction: those which are dealt with in Colleges like the Royal College of Science. I might point out that the experience of every country in Europe that has achieved much success in this work is that the best results come from the work done in the Secondary schools and in the higher Technical Colleges and Universities. In these institutions are produced the leaders of industry, and when a country is provided with leaders of industry—that is, men who can apply trained intellects to the callings of commerce and agriculture and manufactures—the necessary reforms in other grades of education, no less than the industrial development of the country, are pretty sure to follow. That was one of the points particularly emphasised by the body out of which our Department arose—the Recess Committee. We underscored the point in our Report, of which, I understand, the Commission have a copy.

3964. Yes?—The Report pointed out that it was in the higher branches of education the defect lay, rather than in the lower, because from the higher branches, if they were all right, reform for the lower grades of education would soon be insisted on. There is nothing more true than that, or more amply borne out by the experience of successful systems. When we took this work up, then—I may say that we began it at a fortunate moment, because the Intermediate Board had just completed their inquiry, and had come to the conclusion that very considerable reforms in their system should be undertaken, and the main lines of these reforms were in the direction in which we desired to move. It has been a most auspicious circumstance, if I may say so, that the Department and the Intermediate Board were able to arrive with perfect harmony at a common understanding with regard to these grants. Our programme for the Science and Art instruction—Experimental Science, and Drawing and Manual Instruction—has been incorporated in their programme by the Intermediate Board, and schools can now be aided from both sources in taking the matter up. The Secondary schools, therefore, can proceed to co-ordinate their system with both the University system of the country, and that of the higher Technical College, which the Department will have under its care—that is to say, the Royal College of Science. They will be able—and this is, I hope, a reform which will be worked out in the course of the next few years—so to grade and classify their system that they will have one avenue leading to the Technical Colleges, and another avenue leading to the more general University course. I think, perhaps, unless there are any further questions, that that is all I need say on the subject of the Science and Art Grants.

3965. Before you pass from that subject—a school which is in connection with the Intermediate system, at present earns fees as the result of examination, but in the future it is probable—that is quite apparent from our report—that the fees may be earned not only by examination, but as the result of inspection. At present, however, they cannot. But in addition to that fund, and in aid of Science and Art teaching, the same school could also derive emoluments from another public source, viz., the annual Parliamentary grant for Science and Art?—Yes. I will put in as a document this programme in Experimental Science, Drawing, and Manual Instruction, on which this grant is paid.* (*Puts in programme.*)

3966. I want that matter to be quite clear. At present a Secondary School, teaching Science and Art, can avail itself of two public funds: it can, by its connection with the Intermediate Board, partake of the funds at the disposal of that Board; and it can also earn a portion of the moneys annually voted by Parliament in aid of Science and Art teaching?—That is so; but under the Intermediate Board it gets paid for a group of subjects of which this special subject may form one.

3967. Most Rev. Dr. HEALY—One question in connection with this before you pass on. I wish to know, especially for my own information, if you can say whether it is proposed to make this course of Experimental Science, Drawing, and Manual Instruction obligatory in Intermediate Schools or Secondary Schools? Are you in a position to answer that?—I think that is a question rather for the Intermediate Board.

3968. Mr. Justice MADDEN.—As I understand, this programme drawn up is the programme of the Department, not of the Intermediate Board, but the Intermediate Board have adopted it?—Yes, they have adopted it. Here is their resolution:—

> "That the Board adopt the programme in Science and Drawing set forth in the suggested syllabus prepared for Secondary Schools by the Department of Agriculture and Technical Instruction for Ireland; that Natural Philosophy, Chemistry, and Drawing be replaced in our programme by one subject, viz., Experimental Science and Drawing, and that after the present year, until a year's notice shall have been given by us, we shall not hold any examinations in this subject, but shall accept the inspection and, where necessary, the examination of the Department."

3969. Therefore, for the present—what I think the Most Rev. Dr. Healy wants to know is this—your programme, for one year, at all events, represents the work of the Intermediate Board, and there is no Intermediate programme competing with it?—That is so.

3970. Most Rev. Dr. HEALY.—I will tell you the reason I am anxious to know this, and why I am sure a great many people throughout the country are anxious to know it. If we knew that this programme was to be obligatory in our Secondary Schools, we should at once proceed to make efforts for carrying it out. But if we did not feel that it was obligatory, we certainly would not be in such a hurry to do so?—I think the question may be answered in this way. So far as the Department is concerned nothing is obligatory. It is a permissive system. So far as the Intermediate Board is concerned, this subject is not obligatory for the present session; but I understand that the Intermediate Education Board propose to make it obligatory for the Preparatory Grade in the Session 1902–3; in the Junior Grade (Modern Course) in the Session 1903–4; in the Middle Grade (Modern Course) in the Session 1904–5; in the Senior Grade (Modern Course) in the Session 1905–6.

3971. I am right in saying, however, that you have done nothing to make this course obligatory on Secondary Schools?—No.

3972. It is not fair, perhaps, to ask you whether the Intermediate Board, in your opinion, have done anything to make it obligatory on the students who are going in for the examinations of the Intermediate Board?—The Intermediate Board have not made it obligatory for the present session. I think they propose to make it obligatory in the Preparatory Grade next year.

3973. I was given to understand by some of the teachers of these schools that after next year it would be obligatory to some extent on all students in Intermediate Schools?—I think that is the intention of the Intermediate Board, to make it obligatory next year in the Preparatory Grade.

Most Rev. Dr. HEALY.—Perhaps this is not the place for saying it, but I myself would certainly protest against making it an obligatory subject on the students who take up the Grammar School course under the Intermediate Board.

Mr. Justice MADDEN.—I think, as his lordship says, that this is not the opportunity for discussing it, but at the same time it must not be assumed that it is so.

Witness.—There would be no harm in the Grammar School course pupils taking up our programme. Quite the contrary. The programme is conceived on the lines of the Heuristic method, and is meant to be a complementary part of the programme of general culture in a Secondary School; it is not intended to replace or to displace in any way the part of the humanities in the curriculum of the schools.

3974. Most Rev. Dr. HEALY.—I find that in the Junior Grade of the Intermediate Course the Board, in their wisdom, have made for Honours students "Writing Greek Iambics" a part of the course. Do you think it is fair to expect young fellows who go in for writing Greek Iambics to take up also the practical part of your programme in the workshop? As an educationist merely I would ask you that question?—If you ask me that question, I would point out that our programme does not necessarily imply any workshop training. What it implies is an introduction to Science, to a knowledge of natural phenomena, and a method of study, by experiment and investigation, encouraging the pupil to find things out for himself—an old classic method, by the way—which is one calculated distinctly

* See page 232.

to improve the mental training of any boy taking it up. A little of this or a little manual training would be a relaxation rather than a hardship to any boy, even one doing Greek verse. The best proof of that is the way boys take to it in the schools; they are keenly delighted at it, and some of the teachers tell me—for example, down at Clongowes, where I happened to be recently, they told me that it is looked upon as a sort of play, and as a relief from other studies.

3975. That it is useful and desirable for many boys in a school I do not deny; on the contrary, I think it is; but that it ought to be made obligatory on every boy in a school I doubt very much?—That is another question.

3976. There is one point more. Your Department, I understand, will pay to some extent for the carrying out of this programme?—Yes.

3977. The Intermediate Board, I believe, will pay something for it, will it not?—Yes, under the general grant.

3978. In the way indicated in one of the questions, the same school may derive assistance from both sources?—Yes, if a school takes the subject up under the Intermediate Board it will get a portion of their grant.

3979. And they can also get the South Kensington grant?—Yes; this is the South Kensington grant.

3980. Which you give?—That we are referring to now.

3981. Mr. Justice MADDEN.—What has been hitherto called the South Kensington grant, which was administered by the South Kensington Department—the administration of that grant is now transferred to your Department?—Yes.

3982. It is the same grant; that is to say, it is voted by Parliament under the same conditions?—Yes.

3983. Most Rev. Dr. HEALY.—And does not come from your standing or Endowment Fund grant?—Not at all.

3984. Professor DICKEY.—To set up laboratories they can get a grant or a loan from the Intermediate Board, and a grant from your Department?—I do not think the Intermediate Board give a grant for equipment; they only make a loan.

3985. And you give a grant?—We give a grant, during this first year more particularly.

3986. Mr. Justice MADDEN.—You had concluded your observations, I think, with regard to the Science and Art Programme?—Yes.

3987. Arising out of a question of his lordship the Bishop of Clonfert, might I ask you this question: Do you not think that, even for a student who ultimately devotes himself to "the humanities" of a Grammar School education, an early introduction to Natural and Physical Science would be a great advantage?—I do, distinctly.

3988. Now, will you kindly proceed to the next branch of your evidence?—Well, taking it in the order of the funds which we administer, I have mentioned the old Technical Instruction Act grant.

3989. Would you explain, for the purposes of our Report, the former position of that grant?—The former position was this, that if any local authority raised a rate under the Act for the purposes of technical instruction, it was entitled to receive a grant equivalent to the amount of the rate raised for that purpose. That Act has been availed of only to a very small extent in Ireland.

3990. Could you give us any figures as to the extent to which it has been used, or may we take it simply that it has been very little used?—You may take it that it has been, comparatively speaking, very little used; I will give you the figures later on.

3991. It is sufficient to take it that the grant has been very little used?—It was used in Dublin, which maintains out of it the Kevin-street School, of which you may have heard—a Municipal Technical School. It was used in Cork, and it was used in Belfast, and also, rather strange to say, in Galway, where they have had a small Technical School for some years past; and in other places. The total amount of rate raised in Ireland, under these Acts, in the year 1899–1900 was £3,642. But, as I have already explained, we now receive a special endowment for technical instruction to the extent of £55,000 a year. That may be called technical instruction in relation to industries, as a broad distinction from technical instruction in relation to agriculture. It is very hard to draw that line in Ireland, which is an agricultural country mainly, practically without industries, but for the sake of convenience that is the best way, I think, of putting it. Besides that £55,000, it is competent for the Agricultural Board, of which his Lordship, the Bishop of Clonfert, is a distinguished member, to vote in aid of agricultural instruction a sum out of their special endowment for agriculture, rural industries, sea fisheries, and for general purposes. Now, these two grants form an endowment which the Department can administer itself on the advice of these Boards. They are a fixed sum which is not varied or altered by Parliamentary grant every year.

3992. You mentioned the Agricultural Board; you mean the Agricultural Board under the Act of 1899?—I do.

3993. The next point in your Summary is "Schemes of technical instruction in county boroughs, in towns, and in counties." You have dealt fully, I think, with "New programme for Experimental Science, Drawing, and Manual Instruction in Secondary Schools in Ireland, in co-ordination with the Board of Intermediate Education?"—Yes, I think so.

3994. The next point in your Summary of Evidence is "Schemes of technical instruction in county boroughs, in towns, and in counties." Will you proceed to tell us about these schemes?—I have explained that a certain sum, proportionate to their population, is ear-marked for each county borough, but the county borough has to submit to the Department a scheme, upon which the Department is bound by the Act to exercise its judgment before it can approve of the money being so applied. The most important county borough that has taken action under the Department up to this has been Belfast. Dublin, for various reasons—some of which affect the functions of its existing Technical Instruction Committee—has not made any move as yet to utilise the money that is placed at its disposal. Belfast has, so has Cork, so has Waterford, and, to a certain extent, so has Londonderry. But Belfast and Cork have made very important progress. Belfast has resolved to build a large Technical Institute for that city, and to apply a very large sum of corporate money to the purpose. At the suggestion of the Department, its Technical Instruction Committee, at a very early stage of its work, appointed the Principal of this Institute, so that he might be available, as an expert in this branch of education, to assist them in organising a system for the whole city, and in co-ordinating all the local educational institutions which were capable of being co-ordinated with that scheme. That has been done very effectively indeed in Belfast, and, I think, as you will have our two colleagues, Mr. Blair, the Assistant Secretary for Technical Instruction, and Professor Campbell, for Agriculture, before you, the details of such schemes I had better leave for them to describe to you. I think if you ask Mr. Blair to give you somewhat in detail the work which has been done in Belfast you will find it of very great interest, because it is rather a good indication of what we are trying to get done elsewhere. The same applies to a considerable extent to Cork. We got them to appoint the Principal there also, and he, with the local Technical Instruction Committee, is assisting in organising their scheme. A feature of this work of organising technical instruction, both in the county boroughs and elsewhere, in the smaller towns and in the counties, is this: I have already pointed out the importance that we attach to the teaching of Science in the Secondary Day Schools—

3995. Yes?—Well, we have advised the local authorities in these county boroughs to apply a certain amount of their first year's endowment to making grants to the day schools within their boundaries to enable these schools to put up laboratories and equipment for the purpose of taking up the Science programme. And this they have generally done. The task of organising a system of technical instruction has some special difficulties in Ireland, to which I ought to call your attention. Chief among these is the fact that Ireland is not a manufacturing country. Although the work of technical instruction in relation to agriculture has its own difficulties, still, in one sense, compared with the other branch of technical instruction, it is a simple matter. Agriculture is a great and living industry in this country, and the problem of agricultural instruction is how to adapt itself to that living industry, and to endeavour by various ways to serve its purposes. Other branches of technical instruction in Ireland find this immense difficulty: Everywhere, practically, except in certain cities—that is, outside a certain narrow range of occupations—there do not exist industries to which to apply technical instruction. So that a large part of the task of the Depart-

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ment must be to seek out methods by which industries to which technical instruction can be applied can be stimulated. In England and in Scotland the problem is entirely different. It is important to bear this fact in mind in considering schemes applicable to technical instruction in Ireland, because people are apt to take ideas bodily from systems in operation in other countries without fully considering the local circumstances. In England and in Scotland, in nearly every town, they have great industries already in existence, and when you want to organise a scheme of technical instruction there, the question is simply how to adapt it to what is already in existence, and that, I say, is a comparatively simple question. You have to teach young men and young women who are engaged in the daytime at certain callings—you have to teach those people, mainly in the evenings, how to become more perfect at those callings, and how to apply scientific and artistic knowledge to a broader understanding of their work. In Ireland we have not these conditions except in a few places. Consequently, in the beginning of our work, there may have to be some departure from rigid theoretical principles. It is important to bring this out in any general survey of our system. But, of course, the Department have always before their mind the clear conception of technical instruction in its permanent form, as a specialised but organic part of general education, with certain definite and permanent aims—to develop character and capacity; to bring out certain aptitudes; to make men masters of their powers, both of hand and brain. In the long run it is on a population so trained the genuine development of industry in a country must depend.

3996. With what particular branches of industry are these schools which you have established, so far as they exist—these technical institutions—concerned at present in Ireland?—In Belfast, of course, you have large industries there, and the scheme will meet the needs of those industries. You have great manufactures, ship-building, the textile industries, and machine trades in Belfast. And the necessity exists, moreover, for special instruction in relation to commerce, both in the higher and lower grades. The same is true, with modifications, of Dublin and Cork and other cities. In the rest of the country mainly the industries that exist are those connected with the building trades, carpentry, masonry, brick-laying, house-painting and decorating—all that category of trades—and such trades as coach-building and plumbing.

3997. Training for those industries would hardly come within the scope of our inquiry?—You asked me to state the particular branches of industry——

3998. Quite so; but the result is to exclude industries of that kind from our consideration?—I was going to say that there are many towns, such as Wexford, for example, in which important developments of industries, which require a good deal of scientific knowledge, have taken place in recent times. They have now in Wexford one of the largest manufactories of agricultural implements, agricultural engineering works, and bicycle-making works; and they have other manufactures. They have a very promising scheme of technical instruction there which is able to adapt itself to the local industries. For these and future industries and for the work of technical instruction they will require engineers and teachers and trained hands—that is, hands trained in some knowledge of the sciences and arts underlying their work.

3999. There are certain employments in Ireland for which persons are required in considerable numbers, and for which a scientific training which might be of a University type is required. It has come before me very often when trying cases—witnesses have been examined who have belonged to the classes of electrical engineers and mechanical engineers?—Precisely.

4000. And I have observed that in almost every instance, when they stated their qualifications, they have been either English or Scotch. Would there not be employments of that kind available throughout Ireland in the large towns?—Certainly. That, in part, is what I have referred to, and I intended to make reference to that branch of the question more particularly under the head of the College of Science.

4001. Then we will postpone it until then. The next item in your Summary is "Schemes of Agricultural Instruction." Does that appear to you to come within the scope of University Education?—Yes, it does. We are at this moment endeavouring to utilise the College of Science to produce the type of teachers and instructors——

4002. On what I may call the scientific side of agriculture?—Yes, quite so. Without these teachers you cannot attempt to develop any branch of the subject. The need for these teachers is the very first need that we are driven to meet.

4003. In regard to that particular branch, where the University would come in would be in supplying teachers?—In aiding in the training of teachers.

4004. Most Rev. Dr. HEALY.—And instructors?—Yes.

4006. Mr. Justice MADDEN.—That is, not so much the general body of the taught, as the teachers, would be concerned?—Yes; but the system of science instruction begun, in fact, in the Primary Schools, and continued in the Secondary Schools right on through the various grades, would be intended to begin the training of men who would take up the career of teachers, and who would take up those careers, such as mechanical and electrical engineers, to which you were just now referring; it is through the Secondary Schools——

4007. I quite understand that the pupils in these Secondary Schools might ultimately be developed into mechanical engineers and electrical engineers; but with regard to schemes of agricultural instruction, what you contemplate is the training of instructors?—In the higher Colleges, yes; but the Primary and Secondary—or upper Primary—Schools would have to do their work for these agricultural men also.

4008. Then, please give your evidence on this branch: "Schemes of Agricultural Instruction?"—I think the best thing I can do at this point is to put in for the Commission a memorandum on "Agricultural Education for Ireland," by the Vice-President of the Department, which goes very clearly and fully into our policy with reference to agricultural education, and also into the situation of Ireland with respect to the needs of such education.*

4009. I have read that memorandum, and it appears to me that the suggestion that touches our inquiry is at the twentieth page:—

> "For the purpose there is available a still higher institution, which is now also under the control of the Department, viz., the Royal College of Science in Dublin, which is about to be thoroughly reorganised so as to take its place as the principal Technical College for Ireland in the educational programme of the Department."

That is the portion of this memorandum which is more immediately connected with our inquiry, and perhaps you will deal with that suggestion when you come to the reorganisation of the Royal College of Science?—Yes.

4010. Very well then; you will pass from this subdivision by putting in this document?—Yes, I will put in this document. Moreover, you will have Professor Campbell before you presently.

4011. Then the next sub-division is the Royal Veterinary College for Ireland?—That body comes, to a certain extent, under the care of the Department. It was established within the past year. It possesses a charter. The movement to establish it began before the Department was in existence, and in the Act creating the Department a capital sum of £15,000, "which shall not, save with the concurrence of the Agricultural Board, be exceeded," was put aside to be applied for the purpose of providing buildings, fittings, and appliances for the Veterinary College. The application of this money is subject to such conditions as the Department may require.

4012. What branch of the Department has charge of this institution—is it the Agricultural Board?—The supplying of further money than the £15,000, if required, comes under the Agricultural Board, and that Board has already given them an additional sum of £5,000, as the Governors pointed out the fact that the sum of £15,000 would not be enough to provide suitable buildings for them. Then, I may say, in connection with the education of our agricultural teachers and men studying for the higher grades of agricultural instruction, that the Veterinary College can be utilised by the Department; the Professors there will be useful in the teaching of Zoology in connection with the domestic animals to these pupils. The Department requested the Governors, when first we came to deal with this question, to make certain modifications in their charter with a view to bringing the College into more satisfactory relations with the veterinary profession and the agricultural interests of the country than it appeared to have been in at the time we came into existence. That the Governors have very willingly done, and the College

* See page 237.

now has been at work, and has started with a very good nucleus of students. I believe they have now quite forty students.

4013. Is the Royal Veterinary College of Ireland, as an institution, outside the Department? It is not a branch of the Department?—No; it is an institution outside the Department, but receiving its funds through the Department—this sum of £15,000—and receiving from the Department any further sums which the Department may choose to give, and subject to any conditions required by the Department.

4014. But it is not governed by the Department?—No; but there is a body of Governors on which the Department is represented.

4015. You stated that it has a separate Charter. It is a separate body, but it is aided by the Department, and the Department is represented on its governing body?—Yes.

4016. And therefore it is in close connection with the Department?—Yes.

4017. Most Rev. Dr. HEALY.—I suppose it has not taken up the question of founding Scholarships or Bursaries in that College?—I do not think so.

4018. Dr. STARKIE.—What representation have you on the Board of Governors?—We have eight members on the Board of Governors, and I believe we are proposing to take over four. The National Education Commissioners had four members on the Governing Body, in virtue of their former relations with agricultural education, and those, I believe, will pass to the Department ultimately.

4019. Mr. Justice MADDEN.—Have you anything further to say as to the Veterinary College?—I think that is enough on the Veterinary College, unless any further questions require to be answered.

4020. I should like to ask you, as Secretary of the Department, what is the present condition of education amongst the ordinary veterinary surgeons of Ireland: do you think it reaches a high standard?—I think it might, with great advantage to the profession and to the country, be made much higher than it is, and one of the results, I hope, of the establishment of the Veterinary College, and the relations which we propose to create between it and our College of Science, and, possibly, also with the University, would be a considerable elevation of the standard of education among the veterinary surgeons.

4021. Would you point that remark particularly to the knowledge of veterinary surgeons with regard to the diseases of cattle? There are clever veterinary surgeons, we all know, in connection with one particular species of animal; but, do you not think the education of ordinary veterinary surgeons with regard to the diseases of cattle, requires some improvement?—Well, I certainly think there should be more specialisation in that direction than there has been. It was not so much that I was referring to, however, as the scientific status of the education of the profession. Abroad, the standard of education amongst the veterinary profession is very much higher, and the veterinary profession has produced very distinguished scientific men. Of course the profession over here has produced some good men too, but the general level is not so high.

4022. I know that you have inquired a good deal into the foreign systems of education; have you devoted any attention to this particular matter—are you able to say whether Veterinary Colleges have any connection with Universities abroad?—There are close relations between the higher Veterinary Colleges, such as that at Alfort, near Paris, and the University system. They are not University Colleges—they are under the Departments of Agriculture—but nearly all their leading Professors are men who have gone through a University, and it is the ambition of the leading men amongst their profession to acquire University rank.

4023. As a reader of the newspapers, I saw an account of some obscure disease which appeared in the South of Ireland, and I noticed that you brought over—I think from France—a specialist, who appeared to be one of a high class?—Yes; we brought over Professor Nocard, of Alfort. That, by the way, illustrates a branch of our work bearing on the higher departments of education with which we are concerned. We hope to encourage, in the College of Science, and in such an institution as the Veterinary College, a good deal of scientific research, and research especially applied to practical problems in this country.

4024. Such as the outbreak of an obscure disease which I mentioned?—Yes. That was a case of great mortality occurring for years amongst the calves in the South of Ireland, and it was attributed to various causes. We found that nobody could give an intelligent account of its origin, and we resolved to get over a specialist, and the specialist we obtained, Professor Nocard, is admittedly the first man on the subject available. He is a Professor in the Veterinary College at Alfort, near Paris. This gentleman devotes himself very largely to scientific research in connection with veterinary problems. He was a pupil and colleague of Pasteur, and he has discovered the origin of several diseases amongst cattle, and prescribed remedies which are now generally adopted by cattle breeders. So by the courtesy of the French Government—as the Veterinary College at Alfort is under the French Department of Agriculture—we got him over to investigate this disease, and the methods and results of that investigation are a lesson which I hope will be useful to this country in showing what may be done when we have a system for turning out men of that kind.

4025. Well, Mr. Gill, so much for that point. You are about to proceed to the re-organisation of the Royal College of Science?—Yes.

4206. That, probably, is the portion of your evidence most intimately connected with our inquiry?—Yes, I think so. You are probably aware that the College of Science——

4027. Please do not assume knowledge, because your evidence will be read by those who are not aware of it?—Well, I did not care to take up too much of your time with these details.

4028. Your evidence, as representing the Department, should be a complete statement of the former state of things, the changes introduced, and, so far as you can tell us, your programme. Do not hesitate to occupy our time?—The College of Science arose out of an institution that was commenced as the Museum of Irish Industry. That was an institution which, in its turn, arose out of the old provision made by the Irish Parliament in connection with the Royal Dublin Society for the encouragement of education and for other developments.

4029. That Royal Dublin Society was founded about the middle of the eighteenth century?—It was; and throughout that period the Irish Parliament made various grants to the Royal Dublin Society for the encouragement of agriculture and industries, and the arts and education connected therewith. I will not occupy you with a lot of details on the subject; but this Museum of Irish Industry was one of the features of the work of the Royal Dublin Society in that connection. The Royal Dublin Society used to provide a certain amount of scientific lectures throughout the country, and to do other work of a more or less educational kind. It was at length found desirable, in the interests of further development in that direction, that the Government should take up all the expense of this type of scientific education in Ireland, and a Commission was appointed to consider what should be done in that way. The result of the Commission was a report advising the establishment of a College of Applied Science in Ireland—a College for Science as applied to Agriculture and Mining and the industrial arts. The Royal College of Science was established in its present premises in Stephen's-green on that general basis. Professorships in Engineering, Applied Chemistry, Applied Physics, and Natural Science were established, and a system of Scholarships formed in connection with the College. The teaching at the College has been of a very high order indeed, and a large proportion of the men whom it has turned out have achieved considerable distinction in the careers they went in for.

4030. Could you give us the date of the establishment of the College?—The College was opened in 1867.

4031. Professor LORRAIN SMITH.—Under what authority was it?—Under the Department of Science and Art of South Kensington.

4032. Mr. Justice MADDEN.—And its funds were supplied by moneys voted by Parliament?—Yes, by moneys voted by Parliament. This much ought to be said for the work of the College of Science, because it has not achieved, in Ireland, that general favour which I think it deserves. That is due to various causes. With some of them this Commission, in the broader aspects of its reference is concerned; but the chief cause is that this was meant to be a Technical College, and a Technical College can only thrive by being part of a system of technical instruction. There was no such system of technical instruction in this country; our Department has been appointed to organise it. But the College has

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been a most efficient institution for the work it has done. A considerable proportion of the men who use the College come from England and Scotland. I have here a return for the last ten years, showing the number of associate-students—that is, students taking out the full course there.*

4033. You can put in that paper; but you might tell us now the number of students?—In that period of ten years the number of the associate-students who took diplomas was 56. Associate-students are those going through the entire three years' course.

4034. Those you call associate-students?—Yes. Of the number who took diplomas 28 were British—that is, from England or Scotland; one was of a nationality not named, and 27 were Irish. There were 27 Irish, and 29 of other nationalities.

4035. Professor LORRAIN SMITH.—"Associate-students" means those who are contemplating taking the diploma?—Yes; going through the three years' course. But the College is very largely utilised for its courses by students who are taking out the degree of the Royal University, or going through the College of Surgeons, and who go to the College of Science to get the course in Chemistry or in Physics.

4306. Mr. Justice MADDEN.—This would be a convenient time for you to explain to us the constitution of the College of Science. It gives a diploma. Will you explain to us the nature of the diploma, and the course of study necessary to obtain it. I presume you are the witness who can give us that information?—Yes.

4037. You represent here the College of Science?—Yes.

4038. We should desire to know the course of study in the College of Science, and what it leads to?—Yes.

4039. Again bearing in mind that this evidence will be read by those who have no knowledge of these matters?—Yes. I had better point out, at this stage, that the Department have begun to reorganise the College, and that preparatory to doing so the Vice-President appointed a special Departmental Committee to go into its entire working. I will give you the general conclusions of that Committee.

4040. Perhaps you could tell us shortly the existing constitution of the College, the nature of the diploma, and the course of study. I do not mean in detail. If you wish to put in documents which contain all those particulars——?—Yes. I can give you the Directory of the College, which contains them.†

4041. I think that would be a convenient course. There is a recognised diploma granted by the College of Science?—Yes.

4042. And in order to obtain that diploma a three years' course of study is required?—Yes.

4043. In what branches of learning?—In the first year, for all the subjects for which the diploma is given, there is a course of general Natural Science, and the diploma is given in connection with either the Faculty of Engineering, the Faculty of Manufactures, or the Faculty of Physics, or the Faculty of Natural Science. Under the Faculty of Engineering, Applied Mechanics, Hydrodynamics, Engineering, and Drawing are among the subjects taught. Under the Faculty of Manufactures, Advanced Chemistry, and Analytical Chemistry applied to certain industries, are taught. Under the Faculty of Physics, there are Physics and Practical Physics, including Electrotechnology—that is the term used; and in the Faculty of Natural Science there are Zoology, Botany, and Geology. The students receive a diploma, the initial letters which describe it being "A.R.C.Sc.I."—Associate of the Royal College of Science, Ireland. These men, if they take out a diploma in Engineering, are qualified to act as electrical or mechanical engineers; or, if they take out a diploma in Manufactures, to become chemists in manufacturing chemical works; or if they take a diploma in Physical or Natural Science, to become teachers of Science.

4044. Most Rev. Dr. HEALY.—They have no course of Agricultural Science in the College?—Not in the present College. There used to be, but it was given up.

4045. That is what I want to know?—But it is contemplated by the Department to introduce that. That, I think, answers your question.

4046. Mr. Justice MADDEN.—Associate-students are those who are studying for the diploma?—Yes.

4047. And from the whole of Ireland, you say that in ten years there were only 28 who took the diploma?—27 Irish and 29 of other nationalities.

4048. As to the other students who avail themselves of the instruction given by the Professors, not being candidates for a diploma—what is the number of those students?—In Chemistry, during the period of ten years, there were 307—I have the numbers here—in Engineering, Drawing, and Surveying, 126; in Geology, 71; Botany, 107; in Chemistry, 307; Zoology, 85. Physics, 274; Mathematics, 75; Assaying, 67; Mining and Mineralogy, 33; in all, 1,145.

4049. Some of those numbers, I suppose, overlap?—Yes.

4050. A number of students are doing more than one course?—Yes.

4051. Therefore, there were not 1,145 students?—No.

4052. How many students are there at present, all told?—During the present session there are 97 students on the books. Of these 29 are paying associate-students, and 38 are paying non-associate-students. There are 11 Royal Exhibitioners and Scholars, and 19 teachers in training.

4053. Most Rev Dr. HEALY.—You say there are non-associated students?—Yes; they are largely Royal University men, who are going in for Medicine or Engineering; and some of them are grinding for Civil Service examinations.

4054. Mr. Justice MADDEN.—Are they permitted to attend lectures without anything corresponding to Matriculation?—Yes, to attend lectures on the special subjects they require to make up.

4055. Are these different lectures from those given to the associated students?—No; but they can attend the lectures on any subject.

4056. On payment of a fee?—On payment of a fee.

4057. Professor DICKEY.—Do you know if many students going through Trinity College attend the lectures at the College of Science?—I believe some do, because the Science equipment in Trinity is not very good, and some of their men going in for Physical Science come to the College of Science.

4058. Mr. Justice MADDEN.—Is the existing equipment for the teaching of Science in the Royal College of Science satisfactory?—It is much better than anything else in Dublin; but we intend to improve it very much. It requires bringing up to date in many particulars.

4059. Equipment that would have been considered good enough twenty, or even ten, years ago is now not up to date?—In many ways, that is quite true.

4060. Professor LORRAIN SMITH.—What is the general scale of fees?—For the Associate courses the scale of fees is as follows (I quote from the Directory of the College):—

First year (for all faculties).—First term £9, Second term £9, total £18.

Faculty of Engineering. *Second year.*—First term £12, Second term £3, total £15. *Third year.*—First term £13, Second term £3, total £16.

Faculty of Manufactures. *Second year.*—First term £12, Second term £8, total £20. *Third year.*—Total for both the First and Second terms £12.

Faculty of Applied Physics. *Second year.*—First term £12, Second term £6, total £18. *Third year.*—First term £15, Second term £3, total £18.

Faculty of Natural Science. *Second year.*—First term £13, Second term £8, total £21. *Third year.*—First term £9, Second term £7, total £16.

4061. Mr. Justice MADDEN.—What is the fee for the courses of lectures in Chemistry?—For non-associate students the fee payable for any course of lectures is £2. Then there is a scale of fees for practical work; for instance, the fee for a special course of one month in the chemical laboratory is £2; for a special course of three months, £5; for six months, £9; for the entire session, £12. There is somewhat a similar scale of fees for special practical courses in the Physical, Zoological, and the other laboratories. The details are given here on page 9 of the Directory.

4062. Professor DICKEY.—Do they teach Theoretical Chemistry in the College—Pure Science as well as Applied?—They do. In the first year it is all Pure Science. The Applied Science is taught in the second and third years, especially in the third year.

4063. Mr. Justice MADDEN.—You have given us the existing number of associated students; are you in a position to state whether, taking about three decennial periods, they have been increasing or diminishing?—I will put in the returns for you.‡

4064. Very well; so far for the existing organisation of the Royal College of Science. You were proceeding to say that, subsequent to its connection with the Department, the question of its reorganisation was considered?—Yes.

* See page 270. † See page 246. ‡ See page 270.

4065. Proceed with your statement as to that matter?—On April the 5th, 1900, the Vice-President of the Department ordered that a Departmental Committee be appointed to consider and report on the future position and functions of the Royal College of Science in Ireland with reference to technical instruction as relating to industries and agriculture in that country, to report on the requirements of the College as regards staff and organisation, and to make recommendations as to the equipment and nature of the new College buildings, and the following are the names of those who were appointed:—T. P. Gill, Secretary to the Department; Captain T. B. Shaw, Assistant Inspector in respect of Technical Instruction; Mr. Spring Rice, C.B., Auditor of the Civil List, who watched the interests of the Treasury; Mr. J. G. Barton, C.B., Commissioner of Valuation; Mr. W. B. Harrington, of the large chemical manufacturing firm of that name in Cork, and Sir James Musgrave, of the manufacturing firm in Belfast, and Sir Wm. Abney, K.C.B., of the Board of Education, South Kensington, who acted as Chairman of the Committee. The Committee drew up a report which contained many details that would not be of any interest as regards the subject that the Commissioners are considering, but it contained a number of recommendations, the substance of which I will give you. Having considered the special deficiencies of the Irish educational system, it appeared to the Committee that the object of the College should be to give instruction in Applied Science of a character higher than that given in any ordinary Technical or Intermediate School, without, at the same time, entering into competition with existing University Colleges. Its main function, then, will be to supply a complete course of Science as applied to agriculture and the industrial arts for general students, to train teachers for Technical Schools and Secondary Intermediate Schools, in which Science would be taught, and, by means of summer courses, to give instruction in Elementary Science under a scheme primarily designed for teachers. These are practically the principal objects which the College will serve. With reference to the curriculum it was recommended that the Faculties should be in Applied and not in Pure Science, and that they should be the following, namely, Applied Chemistry, Agriculture, and Engineering. I may mention at this point that since the Committee considered these questions the Department itself has been considering the propriety of introducing some special provision with reference to Commerce in the College of Science. The distributive side of industry is as important as the productive, and has its own needs for technical instruction. The teaching of commercial subjects is done at some of our Technical Schools, and a School of Commerce is being organised under our system at Rathmines. In its quite highest grade, Commerce is a most suitable University subject—more suitable than other technical subjects—as an annexe of Political Economy: another subject, the teaching of which in Ireland the Department regards as a prime necessity. But returning to our College of Science report—the need for a Faculty in Mining was not apparent, and it was not recommended that one should be established, more especially as provision is now made at the Royal School of Mines, London, for those who wish for instruction in that subject. Mathematics will be taught in connection with the faculties I have just mentioned. The question of Forestry is one of considerable difficulty, but it is felt that when it becomes necessary to include this branch of study in the College, provision should be made for it in connection with the Faculty of Agriculture. The establishment of a Faculty of Architecture in the College of Science is not felt to be desirable. The teaching of this subject, it is considered, should be left primarily to the Metropolitan School of Art so far as the artistic side of the profession is concerned, but the technical qualifications so far as they can be obtained otherwise than in the actual exercise of the profession would be provided by a course in the Faculty of Engineering. The Faculty of Engineering will be primarily designed for the training of electrical and mechanical engineers. This will necessarily include the preliminary training in the profession of civil engineer. The Department's farm and their Botanic Gardens at Glasnevin will be used in connection with instruction in Agriculture, and the Museum and the National Library, which are also under the Department, in connection with all the faculties. The staff which the Committee considered necessary for this arrangement is as follows:—Seven Professors, that is, Professors of Chemistry, Physics, Agriculture, Mechanics, Geology, Botany, and Bacteriology, and in Zoology; six lecturers or assistant Professors in Mathematics, Chemistry (two, one being in Chemistry as directly applied to Agriculture), Mechanics, Electrical Technology, and Botany; and ten assistants in Drawing, Mathematics, Chemistry, Physics, Electrical Technology, Botany, Agriculture, and Biology, and also two assistants for Manual Instruction.

4066. How does this compare with the existing staff?—It is larger, since it includes subjects like Agriculture, Agricultural Chemistry, Zoology applied to Agriculture, and Botany applied to Agriculture.

4067. Are the existing Professors persons engaged in other occupations, or is this their sole employment?—The principal existing Professors give their whole time to the College.

4068. And do you propose that your seven Professors should give their whole time to the College?—Certainly.

4069. Professor DICKEY.—And the assistant Professors?—And the assistant Professors.

4070. Mr. Justice MADDEN.—They should be the staff of the College employed exclusively in the work of that College?—Yes, that is the idea. The Committee recommended that the Matriculation Examination of a University and the test to be applied for scholarship in the College should be accepted as indicating a student's fitness to enter the College, and they also recommended that for general students there should be an entrance examination, which would include knowledge of one language other than English, either a living language or Latin or Greek. Practically all the recommendations I have outlined are being carried out by the Department. Some of them are now in force.

4071. Most Rev. Dr. HEALY.—Was the Matriculation proposed that of any University?—Any recognised University.

4072. Mr. Justice MADDEN.—Is there anything more in the scheme of reorganisation?—The Committee reported on one point which bears very closely on the question before the Commission. It had been suggested that the College had been suffering by not being able to grant degrees at the end of the course, but they expressed the hope that the Royal University would be disposed to recognise the instruction given in the College, in some such way as the London University does that given in the Royal College of Science, London. I need not say this report was drawn up before this Commission was appointed. The only other branch of the subject that it is desirable to refer to is that we propose certain extensions in the scheme of Scholarships. That does not involve any vital difference; it is merely an extension of what has existed——

4073. It is an important branch of your evidence, and it would be interesting to know what provision is proposed to be made by Exhibitions or Bursaries for the purpose of bringing forward into the College students in that particular branch of learning from the Intermediate Schools?—I will read you the recommendations of the Committee.

4074. Are there at present any Bursaries or Exhibitions?—There are a certain number of Scholarships and Exhibitions.

4075. To be won by open competition?—Yes.

4076. Kindly give us the recommendations?—This is the recommendation of the Committee, but I should like to preface it by saying that it is subject to revision. There are some points which it may be desirable to change, and it is more or less tentative at present, but I think I may communicate it to the Commission as the recommendation of the Committee. It was recommended that there should be a provision made for Scholarships for thirty teachers in training—ten for each year, the course being three years, the instruction to be free, with maintenance allowance at £1 1s. a week, which, in the third year, should the Department see special reason for doing so, may be increased to 30s. a week. Then there are proposed thirty Scholarships, of not more than £50 per annum in addition to free instruction (that would be ten for each of the three years). Of each such Scholarship £25 would be provided from the Parliamentary vote, and the remainder from other sources. Perhaps I should explain that the College of Science is supported entirely from the Parliamentary vote up to the present. Then it was proposed that a sum of £500 per annum be appropriated from the funds of the Department as a sort of endowment for the purpose of "leaving" Scholarships for persons educated in the College. These Scholarships, it was thought, would be of great use in opening careers for promising students, particularly

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those attending the agricultural classes, and it might be styled an apprenticeship Scholarship. Further similar provision to be made for travelling Scholarships. The maintenance allowance of £1 1*s.* a week will be allowed for attendance at the summer course for teachers who are engaged in teaching, which is aided from grants of public money.

4077. Professor LORRAIN SMITH.—To any who like to come to the summer course?—To any who like to come to the course, and who can be accommodated, and are teaching our Programme of Science and Art.

4078. Most Rev. Dr. HEALY.—In any school?—In any school working the programme.

4079. Dr. STARKIE.—That would exclude the Primary teachers?—Primary teachers are less meant. This is intended to be suggested as the regular scheme of Scholarships for the College. Primary teachers are now entitled to come to the short courses, but the Secondary teachers naturally get the preference, because it is for them it is wanted.

4080. Mr. Justice MADDEN.—That "leaving" Scholarship appears to be a new element?—Yes.

4081. Why was it introduced?—The purpose of it was this: Say a student in Mechanical Engineering, who had finished his three years' course with distinction—before he could obtain employment of a remunerative character he should necessarily pass a certain time in an actual manufactory or works, and it is often very difficult to get into these except by paying an apprentice fee. A "leaving" Scholarship would enable him to go in as an apprentice, and spend, say, a year, in the works, and thus become a better-trained man. Or it would enable him to travel and study works and industrial conditions in other countries. Moreover, it would aid research work.

4082. It is not merely a prize, but a means towards completing his education?—Yes; that underlies the whole idea. There is no mere prize contemplated in this scheme.

4083. Professor LORRAIN SMITH.—Have you any idea of the size of the grant to each person—of the amount of these "leaving" Scholarships?—That is a point that we have not come to a conclusion about. It is a matter that will be largely determined by circumstances, the purpose being to enable a man to obtain certain things—the idea of the Department will be to help him so far as may be consistently done to get that thing.

4084. Mr. Justice MADDEN.—Have you anything further to say with regard to your reorganisation scheme?—I think that embodies the main educational elements of the reorganisation scheme. I omitted to say this: that provision is being made for new buildings for the College of Science.

4085. Most Rev. Dr. HEALY.—I should like to know what you are doing in that way?—Three years ago, before the Department came into existence, a committee was appointed to consider a site for the building of new premises for the Royal College of Science, because the existing premises were not at all sufficient for the needs of the College. That committee reported in favour of acquiring certain houses in Merrion-street. These are the houses at present occupied by the Department as its offices, and these and the ground behind them are intended to be the site of the new College. At the time that that committee was appointed, a sum of money was ear-marked by the Education Department of that day for the purpose of this building, and that money, it is hoped, will be available for these new buildings. It is intended to equip and build the College in such a style that it will be what they call abroad a Polytechnique. In every sense it will be a higher Technical College of the best type.

4086. That scheme for the reorganisation of the Royal College of Science was drawn up before the appointment of this Commission, and therefore it was framed in view of the continuance of the present University system?—It was not framed in view of any University system. It was framed with a view to rendering more efficient for its special purpose an institution—a Technical College—which must exist, in any case, as a part of a system of technical instruction. Such a College is an essential part of such a system, and should exist independently of a University system, whatever relations may be established between the two. The recommendation, however, about facilitating students of the Technical College in getting a University degree was put in on the assumption of the Royal University continuing as at present constituted.

4087. Are you in a position to bring before us any views in reference to future relations between the College of Science and the future University system. Of course they would be merely hypothetical. One suggestion lies at the root of every scheme, namely, the institution, in Dublin, of a teaching body, whether College or University, but for the purpose of teaching—it may not be important to emphasise the distinction—for the purpose of its relation as a teaching body to the College of Science, are you prepared to offer us any remarks on that subject?—Yes.

4088. That is a very important branch of the inquiry?—It is one of the cruxes.

At this stage the Commissioners adjourned, and on resuming,

4089. Mr. Justice MADDEN.—Mr. Gill, you had stated, before we adjourned, that your suggestions as to University degrees for students of the Royal College of Science were drawn up in view of the then existing University institutions, more especially in view of the Royal University?—Yes.

4090. Without forecasting the result of our inquiry, but assuming that it would eventuate in the establishment of a new teaching body—whether a University College associated with another University, or a University complete in itself is immaterial for the purposes of my question—if such a teaching College were established in Dublin, do you think it would be possible to establish relations between it and a reformed and re-organised College of Science?—I sincerely hope so.

4091. On what lines might those relations be established?—You will see from the suggestion I have cited from the report of our committee that the committee hoped that some such relations might be established between the College of Science and the Royal University as exist between the Royal College of Science, London, and the London University; from that you will at least see there is a strong desire on the part of those of us who are concerned for the Royal College of Science to have some such connection. That desire arises from several considerations. I take the most sordid, but the most practical, first. It is a matter of great importance to a student going in for a technical course in such a College as the College of Science to be able to obtain a University degree. It has a commercial value, for, as between two candidates going up for a particular post, the man who is able to write himself as a University graduate has the advantage in a great many professions; and as the Scotch Universities and some of the English Universities do enable students going in for these technical courses with great facility to obtain degrees, if our students in the College of Science found any great difficulty in getting a degree there as a result of the same course of instruction we might not have so large a body of students, and the College might not serve the purpose in Ireland which we hope it will. Therefore, from the point of view of the students in the College of Science, on the mere practical and commercial ground, it is important that they should be able to get a University degree if they desire. On other grounds we should be very anxious that the students of the College of Science should have a connection with the University. On educational grounds I think it is of great importance that we should have a connection with the University. I use that expression to make clear a distinction which I consider very important—that is, a distinction between the education a man receives in a University, and the power of writing a University degree after his name. Looking at the matter from the point of view of University education—I won't say a University, because in the suggestions which I venture to put before the Commission I should think that any University which may exist in Ireland, whether it be a new University that you are going to create, or the existing Royal University, or Trinity College—that the relations might be possible with any of these—but looking at it from the point of view of University education which I consider, and I think all my colleagues of the Department consider, to be of the very highest importance for this country, and also for the work which the Department has to do—looking at the subject from that point of view, I would not at all like that the mere passing through the Royal College of Science which now enables a man to get a very useful distinction, that of the Associateship of the College, should in itself enable him also to obtain a University degree. That, I believe, is possible in some of the Scotch Universities. It is possible for a man in Edin-

burgh or Glasgow University, I understand, the moment after he matriculates, to specialise and proceed into a Technical College elsewhere, and spend three years entirely taking out a technical course, and then come up for a University degree, and get his B.Sc. degree in one of these Universities without ever for a moment, since entering the University until he passed this examination, having had the faintest tincture of University culture. I think that a degree given in these circumstances as a University degree is a misleading distinction, because it implies that the man has something more than the Technical College could give him, and I don't think that is right from any point of view. I think that the man himself suffers by not having been obliged, if he desires to obtain a University degree, to obtain the advantage of University culture; and I think in another aspect it is a false pretence, and more or less an injustice, both to the University and to the College which has trained him, and whose own diploma ought to be a sufficient distinction for the work that he has done in it. Therefore, in any relationship between the College of Science and any University in Ireland, I should like that the student who wishes to have both the training of the College of Science in the particular technical course which he goes in for, and the University degree should also get the influence of the University effectively brought to bear on him; in other words, I think that this sort of relationship might be established on a student's matriculating in the University——

4092. You assume the University, or College to be a teaching body?—Yes.

4093. Under the existing system, so long as the Royal University remains a purely examining body the relations are simplicity itself. Any student of the College of Science who chooses to present himself for examination can do so?—Yes.

4094. We are now discussing the question on the assumption that a new body—a teaching body—is in existence, and that the student in the College of Science matriculates in a teaching University?—Quite so. That is the distinction which I make. It is easy for us to recommend a connection of that kind in the case of a mere examining body, but it is a different question in the case of a genuine University.

4095. We have got so far as assuming that the student is to matriculate?—Yes; and this man wants to go through the College of Science, say, for an agricultural diploma, and wishes, at the same time, to get a degree in a University. If he does not want a University degree, he goes into the College of Science direct, and comes out with its diploma; but if he wants a University degree at the same time the process he should follow, in my judgment, should be this: Matriculate in the University—and it might be hoped that Trinity would fall in with this system. Then I think he ought to have a year at least at Arts. He should go as far as the First Arts in the University before beginning to specialise in Science, and then his next year ought to be a year of General Science.

4096. Do you mean the next year in his University course, or in his College of Science course?—I mean, if he is going for a University degree his next year should be Science in a University—Pure Science.

4097. Professor LORRAIN SMITH.—You are not teaching Pure Science?—For the first year there must be a course in general Science.

4098. Mr. Justice MADDEN.—Do you propose, in a reformed College of Science, not to teach it—I am developing your scheme as I understand it. For the Pure Science course that you now have in the College of Science you take a year in a University at Pure Science?—For those who mean to get the University degree; but the College of Science must, at the same time, have its first year for students who enter there without going to a University—must have a first year in General Science for its students.

4099. I may have misunderstood your suggestion; but I understood that the faculties in the reorganised College would be in Applied, and not in Pure Science?—Yes; the faculties and the diploma given would be; but in order to prepare a student to graduate in these faculties he must have one year in General Science, unless he has made very considerable progress before coming into the College. That would be the first year. But the second and third years in the College would be given to distinctly Applied Science and specialised work. In the University the student's first year would be Arts, and his second year would cover practically the same course as would be given in the first year to a man in the College of Science. There would be that much overlapping in the two courses. In the third year for the man going through the University who wishes to take out a College of Science diploma it should be allowable to him to go into the College of Science for its second and third years' work, that is, for the specialised and Applied Science. Then he would come up at the end of that time, which would be his fourth year—two years in the College of Science and two years in the University—he would come up then for his examination for his University degree, and he would also have the diploma of the College of Science for the particular faculty in which he studied.

4100. Do you think a course of training in the College of Science might be substituted for one of the ordinary branches of education?—Yes, for a professional man.

4101. Professional students in the University of Dublin are able to drop out one of the ordinary subjects of University Education in their concluding years. You would suggest something of that kind?—Exactly; and that would secure that the man could be a resident of the University the whole time.

4102. And you would secure that he had some University culture, and had, as well, his professional or technical course?—Yes.

4103. Perhaps it will be worthy of consideration whether the year of Pure Science teaching might not be taken in the University?—I think it might, for University students.

4104. That would work in with your scheme very well?—Yes; and, in fact, it would be preferably so for the man who wants a University degree: the more he is in a University the better.

4105. And it would leave the College of Science more free for what seems to be its peculiar task—Applied Science?—Yes; but it must be borne in mind that the College of Science would be obliged to make provision for a first year of General Science for men who may not want to go through a University, and, therefore, there must be, in any case, a year of Pure or General Science there.

4106. But in the University you would expect to find Pure Mathematicians of a higher stamp than are required in the College of Science?—As to the Professors of that kind the highest available are, and will be, in the College of Science.

4107. Professor LORRAIN SMITH.—Why should you duplicate a course in Pure Science?—Because there may be some men who don't want to go through a University.

4108. You say men of the highest standing and attainments teach in the College of Science?—Yes.

4109. Therefore, they are on the same level—academically—of distinction. Why duplicate it?—How do you mean?

4110. Why have a course for a College of Science student in Pure Science, and another course for a University student in Pure Science?—From the point of view of the College of Science we have to consider that institution as a whole, and as a self-sufficing institution. It is the crown of our system of technical instruction.

4111. Mr. Justice MADDEN.—You may have, and will have, no doubt, students who don't aspire to a University degree?—Yes.

4112. Dr. STARKIE.—Why not allow those who do aspire to a University degree to take their first year of Science in the College of Science instead?—There is no objection to that from the College of Science point of view at all.

4113. Would you have any objection from the University point of view?—I would not have a positive objection; but from the point of view of a man who wishes to have the advantage of a University course it would be, on the whole, better for him to spend a longer time in a University—the longer the time he spends there the better. A teaching University to be complete, must have its Science equipment in any case. It must have means of teaching Science and of pursuing scientific research to the utmost extent, and I see no reason why the University student, who wishes to get the professional or technical course of the College of Science, should not do his year of Pure Science at the University.

4114. You contemplate such a man in the second year taking up other subjects than Pure Science?—No, I do not.

4115. In what would consist the University training in his case?—In that he would be resident in a University, and would be going through his University course of a year longer.

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4116. The result is, he would only go to a class in Pure Science in a University, and for his third and fourth years he would go to the College of Science?—Yes. You realise that the College of Science is meant to be a distinct professional or Technical College. It is rather misnamed at present—teaching only enough Pure Science for the needs of students following its Technical or Applied Science courses. It is not its business to do the Science work of a University.

4117. Do you not contemplate the student you refer to going through the Arts course?—I think, if he passes his Matriculation examination, and goes through his First Arts course that that would be enough for a Science or Technical man.

4118. Most Rev. Dr. HEALY.—That is what the doctors do at present. Did you read over the evidence in the published Blue Book?—Yes.

4119. You must have gathered from that that proposals have been submitted to the Commissioners here to have a teaching University with a number of Colleges; that is to say, University Colleges affiliated practically on the same lines as certain Colleges in London now are affiliated to the London University?—Yes.

4120. And the affiliation consists merely in this, as I understand it: that the University should recognise the teaching staff in that College as University Professors. The Department would have a certain power of superintending the courses, and also superintending the examinations, and then these men would come up in their department, pass their examinations and take their degree, which would be a degree in Arts, although on the Science side. What I want to get your opinion on is this. Suppose that the new University we will call it, whatever its name, in Dublin, were to recognise the College of Science as a teaching College, or University College affiliated to the University in that sense, that is to say, would recognise its staff as the University staff, would superintend the examinations, and superintend the courses, and then when the student in the ordinary way had gone through his course after Matriculation should come up for his degree and take it in Science—if you do that you see it is not necessary to make this distinction between the University teaching and the scientific teaching, because, really, the teaching of the University is the teaching that is given in the College of Science. What do you think of that proposal?—I think, in the first place, that the analogy between the College of Science and the other Colleges that would be affiliated is not complete, because this is a College purely of Science, while the other Colleges are Colleges which have Arts and other courses.

4121. But there are courses in the University of London which have only one faculty?—I would sooner not go into the constitution of the University of London, because I think in many ways it is misleading. It is misleading here. Your point, my lord, seems to be this: that this College of Science might be regarded as practically a College of the University.

4122. A University College in every sense; that is my view; that it could be made a University College in every sense, and its courses would be courses of the University, subject to the approval of the University, and its degrees would be degrees of the University, and it would have a great deal of autonomy under the direction of the governing body of the University?—In the constitution of the College I would prefer, and I think it would be a much more efficient plan for its own work, that it should remain as it now is, an entirely autonomous body. From the point of view of the University I think that would be the best thing, too. The only object that it is intended to have in view is the training in technical subjects of men who are about adopting technical careers. I don't say that is a lower grade of institution than a University, but it is a more specialised, and a narrower branch of education. Moreover, it is a branch directly arising out of our general system of technical instruction in the country. Now I think that such a College, having a clear and definite and distinct purpose of its own, namely, the training of men in that specialised way, will do its work best by being an entirely autonomous institution, and the analogy I would select for it would be that of the higher Technical Schools of the kind found on the Continent, such as the Hochtechnische-schule, at Charlottenburg, in Germany, or the Polytechnics of Zurich, Darmstadt, Stuttgart, and similar institutions. And I think that if the University incorporated into its system such a College in the way your lordship suggests, it would take away somewhat from the broad conception of its position, which, I think, should be the one most kept in view by a University, and I would rather draw this distinction. A man who had only a College of Science diploma, while he was a most completely equipped professional man from the technical point of view, was not so good a man from the point of view of general culture as he would be if he went through a University as well. Your plan would involve giving a University degree to a man who had the first, without the second qualification, giving the cachet of a University to a man who lacked the qualification.

4123. He would have both, in my view?—Some Universities have taken faculties of this kind entirely into their bosoms. Louvain has now one or two faculties of the type, Liege has Mining Engineering, and some German Universities have an Agricultural department; but Continental Universities differ from our conception of Universities in some important points.

4124. Perhaps they are right?—But I was going to say that comparisons between the two types are unfair. A man does not go to a Continental University until he has had a very considerable degree of training in Arts. A man does not go to a University in France—and this is practically the rule all over the Continent—until he has got what is called his baccalaureat, a sort of a B.A. degree, not quite so advanced as B.A., but perhaps as advanced as the Little-go, and therefore he can begin to specialise for his University work sooner than a man who comes into our Universities.

4125. Your proposals, if adopted, would leave the students of the College of Science who wished to graduate, under a very great disadvantage, from which my proposals would free them, for if your proposals were adopted, and if the College of Science was not a University College, it would be extremely difficult for these men to take what is called an intern degree in the University, because the University would not recognise attendance on the lectures of these Professors as attendance on University lectures unless my system were adopted; whereas, if my system were adopted the attendance on the lectures in the College of Science would count as attendance on University lectures for the purpose of getting an intern degree. Or, to put it briefly, the students in the College of Science, under your system, could practically take an extern degree, whereas, if my proposals were adopted they could take it as an intern degree, which would make a great difference?—I don't think that is quite so, my lord. I think it is really a question what the University would recognise. If the University will agree to recognise these young men who matriculate in the University, and go through a year, and, perhaps, a second year, in the University course—if for such men it will recognise two years' instruction in the College of Science in a particular professional course, and count these two years to the men's credit, and enable them to come up at the end of that for examination by the University itself for a Science degree, I think that would be a good thing for the University and a good thing for the College of Science. Both institutions would remain perfectly autonomous, as they should be, but with a sort of reciprocity treaty about these matters.

4126. The University would not do that, except it did what I propose—recognise the Professors as University Professors?—Do you mean recognise them as University Professors?

4127. Recognise them as University Professors in the College recognised by the University—as an affiliated College; and where the teachers were of sufficient eminence to be recognised as University Professors?—What I suggest, in effect, is that the College would be recognised as an affiliated but autonomous College.

4128. I am afraid that could not be done unless you adopt the conditions I indicated in the beginning?—That is that the College should be under the control of the University?

4129. I don't say that exactly; but that the University should recognise its teaching staff as an adequate teaching staff: that they should have a certain control in shaping the courses and directing at the examination through their representatives. These would be the main conditions. As for the governing body you might keep the control of that to yourselves; but you would be expected to have representatives of the University on the governing body in order to co-ordinate the two?—The examinations for the University degree would, of course, be by the University itself. As regards the diploma of the College, I do not think it would be either good for the College or good for the

University that the latter should undertake to prescribe the examinations of the College or control its Professors. One of the dangers to Technical Colleges from University influence is that of becoming less practical; and there is a corresponding danger to the University in the opposite direction from too close a connection with technical teaching.

4130. Mr. Justice MADDEN.—The distinction between what Dr. Healy suggests and what the witness suggests seems practically to be this: the reorganised College of Science, according to your scheme, would have faculties in Applied Science, and you think a University degree should not be given to students unless they have something more—teaching beyond that?—Yes.

4131. And, at all events, one year's training in Arts?—Yes.

4132. Well, I think we have both schemes clearly and fully laid before us?—It is a matter of co-ordination. It resolves itself into that.

4133. Most Rev. Dr. HEALY.—What I propose is to recognise the College of Science as a University College in that department which it undertakes to teach, and nothing more.

4134. Mr. Justice MADDEN.—If that be so it really resolves itself into what may be described as a matter of co-ordination.

Most Rev. Dr. HEALY.—It is a very important question.

4135. Mr. Justice MADDEN.—No doubt. Before we finish your examination there is another branch I wish to ask you a few questions about. The last head of your evidence is, "Provision for the training of teachers." That is a very important branch of our inquiry; and in relation to Technical Education, you will agree with me that the existing provision of teachers is very inadequate?—For technical instruction there has been no provision up to this. It is non-existent, except in so far as the College of Science is training men in Science who are capable of becoming Science teachers, and as the Universities have trained men in Science.

4136. The Department—certainly the Board of Intermediate Education—realise there is very great difficulty at present in starting, in Ireland, a system of technical instruction, from the difficulty of obtaining competent instructors?—Quite so.

4137. Have you any observations to offer with regard to the remedy—I may take it that is an admitted evil?—Yes; the absence of men qualified to act as Science teachers is one of our greatest difficulties.

4138. What views do you submit to us on that subject?—On that point I would like to correct an impression which appears to have been made upon his lordship the Bishop of Limerick, as to our provision for training teachers of Agriculture, and for Science teachers. In reference to Science teachers his lordship, in his evidence, rather laughed at the idea that you could take a man and in six weeks make a Science teacher of him.

4139. Dr. STARKIE.—I think he said three weeks?—Well, I think the main point is this: that if the facts were exactly as Dr. O'Dwyer seemed to think, he would be quite right, and we are quite at one with him, even though it is only a provisional arrangement under the exceptional circumstances; but the provisional arrangement is better than he seems to imagine. Our idea is to take men who are teachers now of Mathematics or other Science subjects—that is to say, men who have had a considerable amount of training and experience in subjects relating to Science. They don't come in perfect ignorance of the subject, and our idea is to take these and prepare them in special courses for giving instruction in the rather elementary course of Science teaching which is involved in the first and second years of our programme, and which is a teaching more of method than of matter. What we have done is this: we have brought, from nearly all the schools in Ireland taking up this programme, teachers of this kind, and we have given them a special course of training at the College of Science, and at other centres in the country—at Queen's College, Belfast, and at Cork—to fit them to teach this programme.

4140. Mr. Justice MADDEN.—It is quite natural that you should make that explanation; but it does not affect the permanent and future arrangements regarding education in Ireland. I presume the sum and substance of the matter is that, finding no provision whatever made for teaching even the most elementary Physical or Natural Science, you have done the best you could under very difficult circumstances, and you regard it as merely a temporary expedient?—Yes.

4141. With regard to the future, what have you to suggest?—Might I add with regard to the future of these teachers that they are preparing themselves as they go along now. They have been taught sufficient for this first year's programme, and they will be given another course before they come to teach the second year's programme, and another before the third, and so on, and, in the meantime, they are doing their work under the supervision of our Inspectors, and are being helped to prepare themselves much more fully than such a course would imply. At the same time, for the future generally, we are giving in the College of Science a number of Scholarships for teachers who intend to place themselves in training to become Science teachers—Scholarships that will enable men to get three years' instruction in the College of Science free, and have a maintenance allowance to enable them to live in the city at the same time. That is a provision which will be a permanent one in the College of Science for the training of such teachers. We have a number of these teachers in training at the College now. So far as a University is concerned, I should say that University influence is more particularly desirable in the case of teachers than in the case of any other body of men. I should hope that this connection between the College of Science may in the case of teachers be undoubtedly established, and, furthermore, I should think such teachers in the University itself might have the opportunity of getting some education in what is usually expressed by the term, "pedagogy." I don't consider it sufficient training for men who intend to be teachers to come up to a Technical College and get trained in Science there, and then go straight back to the school and teach, because they have not really had as teachers a true technical training.

4142. The question of the training of teachers as such has only of late years attracted much attention. Do you propose to have a department within the College of Science for the purpose of training scientific teachers as teachers?—That has not been proposed as yet for the College of Science. I should hope that that branch of the training of teachers might be carried out in the University—that is to say, attached to some of the faculties of the University, say the Faculty of Philosophy, that there might be a Chair of "Pedagogy," and that all teachers, whether Science teachers or teachers in other subjects, should get that training. The University would be the proper place for that.

4143. That I quite understand—that the University, and not the College of Science, should train the teacher. Have you any further observations to make on this matter?—We have likewise now at the College a number of Agricultural teachers in training. That is, men intended to be itinerant instructors, teachers in Agricultural Schools, and so forth, who are going through the full three years' course. On this point, also, I should like to correct a wrong impression of the Bishop of Limerick's. He implied we took a number of young farmers, and gave them one year in the College of Science, and then sent them through the country as itinerant instructors. He would be quite right to ridicule us if we proposed to do that. We propose to train agricultural instructors in a very thorough manner, and give them the full course of the College of Science, and to use the establishment at Glasnevin in connection with that instruction. It is possible what Dr. O'Dwyer had in his head was a special course we proposed to give to a number of young men who already had a considerable amount of Science training, and who might, with one year in the College of Science, be completed in that work. That was the intention. I may say Professor Campbell, who will be prepared to give evidence here, can tell you a great deal about the training of agricultural teachers.

4144. Most Rev. Dr. HEALY.—The main object of the Bishop of Limerick was to point out that you were doing the best you could under the circumstances, and he wanted to show how imperfect your best was, in consequence of the want of University provision for the training of teachers?—Quite so.

4145. Professor LORRAIN SMITH.—I understand it is Secondary Schools to which your Department has given this help?—We give help to Secondary Schools, but we also establish special Technical Schools.

4146. But it is specially Secondary Schools you are dealing with?—No. Except as regards Science and Art grants.

4147. Not Primary?—No; we cannot deal with the Primary grade of education.

4148. How does the Department come into connection with the artisan class? Am I right in saying the

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artisan class don't go to the Secondary Schools?—Certainly. We come into connection with the artisan class directly through the evening Technical Schools, and indirectly, I hope, through future readjustments in Primary and Secondary Education. Our policy is to proceed on the idea of the education of the country being considered as a whole, and there being the closest co-ordination between the Primary system, the Technical system, the Secondary system, and the University system. Well, the Primary Schools are now undergoing considerable re-organisation, and that re-organisation is in the direction of fitting their pupils better to avail themselves of the practical forms of education with which our Department is specially concerned. In other words, a boy in a Primary School, if educated in the new programme, will be in a better state to enter a Technical School now than he would have been under the old system, so that, while we are not dealing with the Primary Schools, which are under the jurisdiction of Dr. Starkie and his Board, yet Dr. Starkie and his Board are acting in close co-ordination with us in that connection, for they are preparing boys of the artisan and of the small farmer class throughout the country to receive our technical instruction. This, I hope, will be still more systematically done in the future, as the work develops and permits.

4149. You contemplate that pupils from Primary and Secondary Schools will come to the Technical Schools?—The pupil of the Primary School who leaves school at the age of fourteen in a town, and goes into employment—it is for that pupil that the Evening Technical School is intended, and if the Primary School does its duty, that pupil will be able to come almost directly into the Technical School.

4150. Dr. STARKIE.—Would they enter the Technical School as early as fourteen?—Generally speaking, no. I think they should have a Continuation School course of a year or two before they came into the Technical School.

4151. And you know that under the National Board for many years there have been evening classes, which have not been very flourishing up to the present, and now that the Treasury have given us better terms for paying the teachers, that these schools are likely to be a success. Now, what you contemplate is that children leaving the National School from twelve to fourteen should attend an evening National School for a year, and then enter an Evening Technical School?—I think for a year or two, at any rate.

4152. A great number of National School children leave as early as twelve?—They should go on for a longer term.

4153. I may say the majority leave school at the fifth standard?—It would be much better they went through an Evening Continuation School at that age than go directly into a Technical School. They would be wasting the time of a Technical School at that age.

4154. Mr. Justice MADDEN.—Would they find their way to the University or the College of Science?—There should be a ladder of progression which would enable the *elite* of such pupils to do so.

4155. What would be the steps of that ladder?—A system of Bursaries and Scholarships.

4156. Bursaries in the Technical Schools?—Yes, enabling boys and girls to come from the Primary Schools or Continuation Schools into the Technical Schools.

4157. Does this system form part of these schemes you have been mentioning in Belfast?—The schemes have not got to the point where that system will come into operation, but it is most distinctly the view of the Department that that should be carried out.

4158. Professor LORRAIN SMITH.—What I want to get at is this: Up to what age will a boy of fourteen or a year or two older remain in the Technical School? That will altogether depend. I am assuming this is a boy in employment during the day, who has only his evenings to give to the work. When he takes up a particular branch, say he is engaged in engineering works, and during the evening he is receiving instruction in Science and Art applied to his calling, he is being made a much more efficient apprentice, or whatever he may be, and it all really depends upon himself and his progress how long he may stay there. He may, if a very clever lad and if he distinguishes himself very much, he may make considerable progress both in his employment and in his educational work.

4159. When does he come to the College of Science—he is passing through his apprenticeship when passing through the evening classes—then the next stage is what?—If he so distinguishes himself at Science as to be able to win a Scholarship at the College of Science, then he could proceed into the College and be maintained by the maintenance allowance attaching to the Scholarship while going through the College of Science.

4160. When he leaves his employment what does he do?—That is a question he has to determine for himself. If he is in a big city like Belfast, where there is a Technical Institute, he might be able to go as far as ever he wants without leaving his employment.

4161. The point is whether that Technical Institute concludes his education. It brings him up to the point he should enter for the Matriculation Examination to the College of Science or University—is that the scheme?—Practically so; but this should be always borne in mind that the function of a Technical College of the grade of the College of Science is not to train men who are working as artisans, and who intend to continue such work. It is rather to train leaders of industry—men who will be manufacturers themselves or teachers.

4162. Why should students who pass through the Technical School at Belfast enter a course of University standing—why should they not pass to the College at Belfast?—To the Queen's College?

4163. Yes?—That raises another question, and the question there is this: Whether the Queen's College, under the new system, should take on a technical side, and do the sort of work that the College of Science is doing, or whether it should effect a co-ordination with the forthcoming Technical Institute in Belfast, and utilise that Technical Institute in some such way as I suggested the University might utilise the College of Science. The present aim of the Technical Institute—the aim, at any rate, with which it started—is not to do that grade of work. It has other work to do of vital importance, but that is largely a question which, I think, if this Commission ever result in a Statutory Commission being appointed to work out the details of a University system, might very well be solved then.

4164. Would it not seem to you anomalous to bring students from a centre of industry like Belfast to anywhere else to teach them technical subjects?—That is mainly a question of convenience. I would not say it was anomalous at all. I think the wider a man's experience is made for him the better for himself, and I hope we shall attach to the College of Science a Scholarship to enable men fully trained to go abroad and see something else.

4165. But their experience in these matters are got in the centres of industry?—You asked me was it anomalous, and I say it is a matter of convenience rather than a question of anomaly. I do think it would be a good thing undoubtedly for a technical student in a great centre of industry like Belfast to be able to go to the full extent of his training there up to the point where a travelling Scholarship might enable him to go further.

4166. Dr. STARKIE.—A Technical Institute in Belfast would be a second College of Science?—In the case of the Queen's College up there utilising the College in the sense the College of Science is utilised here it would be.

4167. Professor LORRAIN SMITH.—Would the College take the University standing sketched by his lordship? According to your scheme that brings the student up to a point where he may enter a College, whatever form that College takes, and these University Colleges should fit themselves to give technical training both here and elsewhere—that is a natural completion of the scheme?—Well——

4168. Mr. Justice MADDEN.—Would that not depend on local circumstances? Supposing there was in Dublin a University College or University and a very high-class School of Science, there might be different relations in that case between the University and the School of Science from those that would exist elsewhere where a Technical School did not carry a student quite so far?—Yes.

4169. But if a Technical School in Belfast were developed to the same height, or attained the same position as the central College of Science in Dublin, there might be similar relations between it and the College in Belfast?—Yes.

4170. Professor LORRAIN SMITH.—Or the College should undertake technical work?—Yes.

4171. Mr. Justice MADDEN.—As a sub-division of labour and a saving of expense the University or College might utilise for special purposes the teaching given in the School of Science—that is what you suggest?—I don't suggest it; I say that is one of the possibilities in Belfast.

4172. But for the purposes of a University degree there should be something more than the merely technical teaching of the School of Science?—Yes.

4173. Professor LORRAIN SMITH.—There is a good deal of evidence that a separation of technical teaching from the University such as happened in Germany has been rather a mistake educationally speaking?—I don't think that is a question that opinion has settled at all. It does happen to be a question about which educational opinion is now most exercised. It is one of the cruxes of the University question in Germany. The higher technical schools have clamoured for either of two things—either to be entitled to give degrees themselves—a degree of "*doctor rerum technicarum*"—or be affiliated with the Universities and recognised as University Colleges. There is quite a warfare going on on the subject.

4174. The feeling is in favour of the University connection between technical teaching and the University?—I rather think it is going in that direction. In looking at the question from our point of view in this country, I do think the connection should be established. The objection from the University point of view abroad is that it might narrow University teaching, and lower the ideal, but here I think that that danger would not exactly arise, and I think at the same time that there are such pressing needs, on the other hand, for the Universities recognising and taking into their scope of work preparations for the practical callings that these considerations outweigh. No one is more anxious than I am to preserve the true ideal of University Education. I think it more important than ever, in this age of specialisation, that education should preserve for people the power of looking at things as a whole, and this only the influence of the Universities can do for us. Moreover, these highly trained young men going in for practical careers will have great influence in the future of this country—influence with the people—and they ought to be able to think capably on other things besides their technical subject. That is a chief reason why I should like the University to cast its wing over them.

4175. What is the relation of your Department to the Museum here?—It came over to us with the College of Science from the South Kensington Department.

4176. Whence comes the money that supports it?—It is a Parliamentary grant.

4177. Would it be asking too much to request you to give us details as to the amounts given in each department—Geology and those other subjects?—I could not give them to you on the spur of the moment, but I can supply them to the Commission.* The College of Science, for instance, receives an annual endowment of £8,744. That was last year's amount.

4178. Most Rev. Dr. HEALY.—A Parliamentary grant?—Yes; the Museum gets £13,292.

4179. Professor LORRAIN SMITH.—Does that cover the Library?—The Library receives £3,732, and the Botanic Gardens £3,842.

4180. These are all under the control of the Department?—Yes. About Belfast, I should like to say that this question is rather a burning one—the relations between the College and the Technical Institute. It is largely a local question, and I would not like to express any very positive opinion on one side or the other as to whether the Queen's College should do this work. But this I say without hesitation, that the problem is not one of those past the wit of man to solve.

4181. Dr. STARKIE.—You said a good deal about the relations between the Royal College of Science and the University, and I need not ask you any questions about them; and also about the relations between the Primary Schools, the Continuation Schools, and the Technical Evening Schools, but up to the present my ideas are not quite clear as to the relations that are desirable to be set up between the Secondary Schools and the Primary Schools. I have inferred from your evidence that you think it desirable that the National School children who don't wish to go to their respective employments at eleven, twelve, thirteen, or fourteen, should be encouraged to enter the Secondary Schools, and, through them to rise to the University status, if possible?—Rather to proceed through Continuation or Upper Primary Schools to Technical or Commercial Schools.

4182. Of course, you are aware that there are great difficulties in the way—poverty, for instance—and how would you propose to meet obstacles of that kind—would you propose that the Intermediate Board should establish Bursaries, to be given to the best pupils in the National Schools, and encourage them, say, at fourteen, to enter the Secondary Schools?—That would be one way of doing it; but I think both the Intermediate Board and the National Board and, I may say, our Department, as well, ought, before producing a scheme of Bursaries and Scholarships of that sort, to come to very clear notions as to the respective lines of progress they want to set out before special classes of people. I think you should do as they do under more highly organised systems abroad: make one class of the sort of people who can only afford to give their children a school education, say, up to the age of thirteen or fourteen—a day school education; and that one should plan out a system of encouragement for that class of people which would not be precisely the same thing as for people who can afford to keep their children at school till sixteen.

4183. We have made some provision by means of Evening Continuation Schools for those unable to remain at the day school?—That is the line of progress for that class of people; but it is important not to confound that class with the class who can keep their children at school, say, to sixteen, and whose line of progress might be in a somewhat different direction; and finally there is the class that can keep their children at the day school much longer than that. If these distinctions are borne in mind, the system of encouragements will be simplified. The first class, who can only keep their children at school to the age of thirteen or fourteen—the Continuation School is the first mode of meeting their case. In the evening their general education is continued in one of these schools, and they can proceed to the Technical School. They can be enabled to do so, and if they are living in the same place in which the educational facilities are provided they don't need any Scholarships. They might need getting the teaching free, but they don't need Scholarships for that. But for those who can keep their children longer than fourteen there is wanted, in this country, a class of school like the higher Primary Schools in Germany and France, the "Realschulen" and the "Ecoles Primaires Superieures." Some such idea was before the National Commissioners long ago, when they first started the Model Schools. I am strongly impressed—and I think all who have come into close contact with the actual problem must be impressed—that this is one of the most necessary requirements of the system in Ireland—an effective type of upper Primary or "modern" Secondary School.

4184. Most Rev. Dr. HEALY.—Literary or technical?—That is another question. If these classifications are followed a natural classification of the curricula will follow. For the second class—these would be people who might become clerks, who might get into small employments, and go in for technical careers, and who could be kept at school up to the age of sixteen—there should not be any real specialisation in the educational course; but for that class of pupil I think the classical side of education might be entirely dropped, and a course of general education might be given, which would prepare them more directly for the class of employment they were likely to go in for.

4185. Commercial and technical?—Yes.

4186. Dr. STARKIE.—You have not touched on the relations of the Primary Schools to the Secondary Schools?—For the two first categories I am speaking of, I think a type of school like a higher Primary or "modern" Secondary School, which would be non-classical, would be the sort of school to encourage them to enter. The Realschule is the nearest thing to what I mean. We have not that class of school *per se* existing in our system, but we have the makings of it. We have Secondary Schools, which have modern sides, and one of the groups of Intermediate subjects is intended to get schools to put on a modern side. I think a Scholarship for the pupil of a Primary School, who could remain at a day school till the age of sixteen might be given to enable him to enter the Secondary School on its modern side. Supposing there is a Secondary School in a district or town, the fees of which such a pupil cannot pay; a Bursary that would pay the fees of that Secondary School to enable him to enter its modern side would be the sort of thing I should mean as a connection between the two. Much might be done towards evolving schools of this kind, with well defined aims, if the Intermediate could pay on a complete programme tested by inspection. In rural districts, where the pupils are mostly of the agricultural class, and are intending to go in for a farming career, if a Secondary School exists, it will teach Science, and have a Science course with direct relation to Agriculture—that would be the sort of school that would suit. In some districts of the country—that district of the country with which the Bishop of Clonfert is chiefly acquainted—I am aware there are very few Secondary Schools, and the idea would be to

* See page 272.

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get one of the National Schools to put on a Secondary or higher Primary side, to act as a district school, and aid the pupils in the Primary Schools of the district round by Scholarships to enter that district National School. Finally, there is the third category—those who can remain at school beyond sixteen; and for these there is your Grammar School course leading to the University, or a modern course, with Latin, leading to higher technical or higher commercial training.

4187. As you have spoken of his lordship's diocese I should be glad to ask you what is your opinion of the scheme proposed and submitted to the Agricultural Department, by the President of the Galway College. It is given on page 363 of the Appendix to our First Report—do you think, if you have a College of Science in Dublin, and a Technical Institute in Belfast, that there would be room in the Province of Connaught for such a department in connection with the Queen's College there—do you think there would be sufficient material?—I would sooner not express an opinion on the actual scheme submitted, but I am aware that the question of what is to be done with Galway College is one of the problems for the Commission, and this scheme has been submitted to our Department. My answer on that subject would be, if that very handsome building, with its considerable sum of money for maintenance did not exist, that we should not propose to establish, at this stage of our development, at any rate, an Agricultural College—that is an agricultural institution of the collegiate type—in such a place as Galway. But the practical question is—there is a fine building and a large sum of money, and what is to be done with it—what is the best use to make of it. It is a subject we have discussed in the Department more than once, and you will have Professor Campbell before you, and you will hear his views on agricultural education generally, and this point, too. We have come to this conclusion: that the College could be turned to useful purposes in connection with Agriculture. Assuming that it carries on its work of general education, its Arts course, and that the people of the province are encouraged to avail themselves of it, I think the College will fulfil a very useful function in that province, where at present, comparatively speaking, no very extensive provision for Intermediate Education exists.

4188. Intermediate Education?—Yes.

4189. You don't contemplate it remaining as a University College?—It is hard to answer that question exactly. What I think is this: that in its Arts course it might begin a little earlier than the University in Dublin, and might do the work of the upper stages of the Intermediate, and thus meet what I think is a need in the Province of Connaught. If the College had a number of pupils of that sort going to it it would be a practical thing, as large numbers would come from the agricultural class, that there should be an agricultural side attached to the College, so that those who wished to go in for farming careers, or desired to prepare themselves for higher agricultural education, might get a certain amount of their training there.

4190. Then you suggest that the course in Galway College should commence at an earlier stage than the first year in the University—would you propose it should terminate at an earlier stage than the B.A. degree in the University?—I throw the suggestion out with all diffidence; but that is in substance what I suggest.

4191. When you were dealing at some length with the relations between the College of Science and the University College you said in your opinion it was desirable that those whose ambition it was to get a University degree should attend one year's Art course at the University or the College?—Yes.

4192. And in connection with that, I think it was the Lord Bishop referred to what obtains abroad in similar Colleges, and you stated that an Arts training was assumed on entering the University—now, assuming that those who completed the course in the technical department qualified for the University degree, I should be glad to know whether it is possible to establish something of the same character in this country—would you be in favour of the Intermediate Board giving certificates to those who qualified or reached a certain standard in the Middle or Senior Grade, to relieve them of the first year's Arts course in the University?—I have no hesitation in saying "leaving" certificates, to qualify for Matriculation, would be a most desirable thing; but as to enabling students to qualify at school for the first year in Arts, I am not so clear. I think it is desirable that a teaching University should have hold of its students for as long a period as possible; and if such a system—I mean of schools doing University work—were pursued beyond a certain point, you might deprive the University of a good deal of its character as a teaching body. Still the schools abroad do this much, and where you have a very efficient system of Intermediate Schools, the plan ought to have great advantages. It is really a question of convenience, I think.

4193. The Royal University have experienced that difficulty. They have insisted, in the case of Medical degrees, on one year's Arts course, and it has been pointed out by many witnesses that the effect of that has been that the number of students taking Medical degrees in the Royal University has been decreasing?—Well, if you insist on a year's Arts course, it necessarily lengthens the course for the student, and increases the expense.

4194. I don't think it is necessary to have longer time spent at school, but that the training given should be of a higher type. If a boy at school knows he can shorten his course at the University by a year of study at school, should not he be encouraged to do so?—I think he should, and that everything should be done to make the standard of school teaching higher than what it is now.

4195. In Scotland the effect of insisting on a higher standard of Matriculation has been to improve the standard of the Secondary Schools immensely?—Yes.

4196. If "leaving" certificates were given in Intermediate Schools in Ireland, would you anticipate a greater amount of energy on the part of students in study?—I would, especially with a good system of Scholarships from the Intermediate Schools to the Universities.

4197. Professor DICKEY.—Out of the 372 schools under the Intermediate system, how many took up the new programme in your Department?—That is a question I could not answer precisely at the moment, but in those courses for training teachers that were organised during the past year there were 196 schools represented. That number did not represent the total number of schools taking up the course. Some of them had Science teachers already trained.

4198. Do you mean that there are 196 schools you are assisting?—196 schools had teachers in for this special course we gave.

4199. To instruct the teachers?—Yes; we had to reduce the number, because we had not accommodation.

4200. Did you give grants to these 196 schools?—Practically to all of them.

4201. Some of them are girls' schools?—Yes.

4202. The ladies' schools are taking up the programme?—Yes.

4203. A good many schools did not need any grants from the Department for equipment?—Most of them asked for it.

4204. In making the grants did you take into consideration at all the pre-existing endowments of the schools—some in the North of Ireland were pretty well endowed—did you give grants irrespective of their endowments?—Generally speaking, we have taken into consideration the working of the new programme and the fact that they will have to go to special expense for that purpose, and we think the best thing we can do at this moment is to remove all obstacles from their way.

4205. On what principle do you allocate the sums at Belfast, Derry, Limerick and other towns?—For county boroughs the principle is that of population; the grants are allotted to those centres in proportion to the population.

4206. You don't take into consideration the special needs?—By the Act we cannot do so. In the Act, these six county boroughs are put into a special category, and they have a sum of money set aside in proportion to their population; but with regard to the rest of the country, we take into account the scheme itself, its utility to the district, and the needs of the district, and also the amount and proportion of local aid forthcoming.

4207. I think you said in Derry the technical school was not promising to do great things?—I said up to this it had not made much progress.

4208. Is there any special reason for that?—They have been bungling over the question about giving this aid to the Secondary Schools; for some reason or other they have hesitated to enable the Secondary Schools of the place to put up the equipments. That is one of the reasons.

4209. But there is room for a good Technical School in Derry?—Undoubtedly.

4210. They have shipbuilding and textile industries?—Undoubtedly.

4211. Coming to the Royal College of Science and the University, do you suggest that the Professors of the Royal College of Science should be the examiners in those particular subjects that their students would be presented for examination in?—I think that is the best principle, possibly with some outside examiners. But for the University degree it should be the University that would examine.

4212. I am speaking of the University: You think students attending the College of Science should be able to obtain a degree of Science in the University. Would you not suggest that the Professors in the College of Science should be with others the examiners?—The College of Science will have to examine itself for the diploma given to its own licentiates or associates; but the student who wished a University degree should have to undergo a University examination. If there was real co-ordination between the College and the University, there might be representation of the Professors of the College on the Board of Examiners. But I think the University should dominate that examination, and I hardly think such representation from an outside body would be necessary.

4213. There would be more Universities than one, probably, in Ireland, and the Royal College of Science was intended to be an institution for the whole of Ireland, and not for any one part?—As I said in the beginning, I would hope in any readjustment of the University system, that other Universities would make use of the College of Science. I don't see why Trinity College, for example, should not do so.

4214. And if there was a University at Belfast, the same thing?—Yes.

4215. How are the Professors of the Royal College of Science appointed at present?—They are appointed at present by the Department. They were previously appointed by the Department of Science and Art in South Kensington.

4216. Do you mean they are now appointed by the Department?—Yes.

4217. Or by the Board?—The Department. They are paid from the Parliamentary grant. The Board has nothing to do with the funds out of which the College of Science is maintained.

4218. When you speak of the Department, what do you mean by it?—The Department is, so to speak, the Executive Body. The relations between the Department and the Board of Agriculture in reference to the funds administered are somewhat the same, on a much more restricted scale, as those between the Government of the day and Parliament.

4219. Mr. Justice MADDEN.—What Professor Dickey wants to know is this: There was a change in the mode of selecting Professors from South Kensington to the Department. Professor Dickey wants to know by what body in the new Department is the duty of selecting Professors exercised?—The actual appointing is in the hands of the Vice-President of the Department. He acts, of course, in consultation with his colleagues. The position of the Department in relation to the College is in every way that of the South Kensington Department in relation to the Royal College of Science in London. Our College is the apex of the system of technical and agricultural education the Department has been appointed to organise.

4220. Professor DICKEY.—Is there any possibility of the religious difficulty arising in the appointment or dismissal of Professors in that College?—It has not arisen, and I don't anticipate it will.

4221. Most Rev. Dr. HEALY.—As long as you have the appointment in your hands?—Yes.

4222. That makes all the difference?—It does.

4223. Professor DICKEY.—How are the teachers of the Technical Schools appointed, say in Belfast?—By the local authority, with the approval of the Department. What happened in Belfast was this: They advertised for a teacher, and they got a great number of applications, and they sent us up the names of those they selected—eight or ten names that they thought would be good men, and asked us to make a suggestion to them. We made inquiries, and sent them three names that we felt quite sure were those of men capable of filling the post. They selected one of these.

4224. For the post of head master?—Yes.

4225. And the other masters are appointed by the local body?—They are all appointed by the local body, but subject to approval by the Department.

4226. And the head master is consulted in all appointments under him?—I should think so, as a matter of course.

4227. The Royal College of Science, in addition to being an institution for all Ireland, takes the place of a Technical College for Dublin?—Not specially so.

4228. But there is no other Technical College in Dublin?—Dublin, like Belfast, gets a special grant under the Act for technical instruction in proportion to its population. Belfast gets upwards of £10,000 a year for that purpose, and Dublin gets between £9,000 and £10,000 a year, roughly. It is open to Dublin to establish a Technical Institute like that of Belfast, but Dublin has not yet taken any step in the matter. There is in existence in Dublin a Technical School under the old Technical Instruction Act, in Kevin-street, but it is not on so large a scale as the proposed institute in Belfast.

4229. Mr. Justice MADDEN.—We have returns of Intermediate Schools. Would you have any objection to furnish us with similar returns as to students in the College of Science?—I will furnish the Commission with a return.* I should wish also, if you will permit me, to hand in an extract from our First Annual Report, which deals with the general educational policy of the Department.†

The Witness withdrew.

Professor J. R. CAMPBELL, B.Sc., Assistant Secretary in respect of Agriculture of the Department of Agriculture and Technical Instruction for Ireland, examined.

Professor J. R. Campbell, B.Sc.

4234. Mr. Justice MADDEN.—You hold the position of Assistant Secretary in respect of Agriculture in the Department of Agriculture and Technical Instruction in Ireland?—I do.

4235. Previous to your appointment to that office I think you filled the position of Professor of Agriculture in Yorkshire College, Leeds?—Yes.

4236. For how many years were you connected with that College?—Two.

4237. You hold the degree of Bachelor of Science of Edinburgh?—Yes.

4238. And Yorkshire College, Leeds, is affiliated with the Victoria University?—Yes.

4239. We have had a full statement from the Secretary, Mr. Gill, of the constitution of the Council of Agriculture, and the general functions of the Department in respect of Agriculture, and I will not take you over that ground again. Would you commence by giving us some information as to what has been done for agricultural education—the higher scientific education applied to Agriculture—in England, more particularly in the Colleges with which you were yourself connected?—I propose to speak, in the first place, with regard to agricultural education before 1890—before the passing of the Local Taxation (Customs and Excise) Act. That Act made a great change in agricultural education in Great Britain. Before 1890 Agriculture was taught in one University, viz., Edinburgh. There has been a Chair of Agriculture in that University since 1790.

4240. A Chair of Agriculture?—Yes; and an annual course of lectures in Agriculture has been delivered; but there was no systematic course of training in the application of science to Agriculture.

4241. Was there since 1790 a Chair of Agriculture in the University of Edinburgh?—On reconsideration I am not quite sure that it was a Chair at first; but at any rate there has been a lectureship. In 1886 a degree in Agriculture was instituted, and provision was made, either in the University or in extra-mural schools, for qualifying courses in Agricultural Chemistry, as well as in Agricultural Science generally.

* See pages 270, 271.

† See page 244.

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4242. Was that a University degree or a diploma?—A degree.

4243. Was any Arts course required for candidates for that degree?—No Arts course was required. In addition to the Agriculture taught at Edinburgh University there were, before 1890, one or two private schools for the education of the higher classes—the sons of landlords and farmers of means. In addition, the Science and Art Department provided instruction in Agriculture, but instruction of a very unpractical nature; and finally the private study of Agricultural Science was encouraged by the Highland and Agricultural Society of Scotland, who held an annual examination and granted a diploma. That diploma did a great deal in promoting agricultural education. After the passing of the Local Taxation (Customs and Excise) Act, large sums of money available for Agricultural education were given to County Councils. Several of these proceeded to subsidise collegiate centres, while several preferred to keep the money in their own hands. The number of collegiate centres at the present time is about ten. I believe I am right in stating that now every University in Great Britain, with the exception of Oxford and London, recognises Agriculture either as a subject for a degree, or, at any rate, as a subject of University Education. Indirectly, London and Oxford also recognise Agriculture. All this has been accomplished within the last ten years. I shall now make a statement with regard to the courses of study for the degree of B.Sc. at the Glasgow and Victoria Universities. I select Glasgow because it will serve as a type of the Scottish Universities, and Victoria because I have taught Agriculture in one of its Colleges, and it will serve as a type of the English Universities. And, further, before going to the Yorkshire College, Leeds, I was five years Assistant Professor of Agriculture in the Glasgow and West of Scotland Technical College, and am, therefore, familiar with agricultural education in that city. At Glasgow University, for the degree of B.Sc., there is a preliminary examination, which may be passed before the student enters the College, or it may be passed any time before he sits for the first Science examination, but not necessarily before he enters on his course of study. The preliminary examination comprises English, Latin or Greek, Mathematics, a Modern Language, or Dynamics. There is an Intermediate examination comprising Biology or Mathematics, Natural Philosophy, and Chemistry. Then there is a final examination, which comprises a large number of subjects, viz., Agriculture, Agricultural Chemistry, Agricultural Botany, Geology, Agricultural Entomology, Veterinary Science, Economic Science as applied to Agriculture, Engineering Field Work, and one of the following, viz., Forestry, Experimental Physics, or Engineering.

4244. What does that lead to?—The degree of B.Sc. At Victoria, where the degree was instituted two years ago, there are also three examinations. The first two are, to all intents and purposes, the same as at Glasgow; but the final examination is very different, and from the point of view of higher University Education the difference is noteworthy. In Glasgow all the subjects in the final examination are technical. Altogether, nine subjects must be taken, whereas at Victoria there are only two subjects, and one of them technical. At Glasgow a student may obtain a degree without having studied any Science very thoroughly, whereas at Victoria students of Agriculture must have studied at least one Science thoroughly. Another very important difference between the two Universities is this, viz., at Glasgow University no provision is made for teaching Agriculture, or the application of Science to that subject. Instead, the University recognises these classes as taught, either in the Glasgow and West of Scotland Technical College, or at the newly-created West of Scotland Agricultural College. In fact, students of Agriculture who intend to graduate attend the agricultural classes at the last-named school. I now wish to compare briefly what is done at Glasgow and Victoria with what is done at other Universities.

4245. In the Victoria University, is there teaching in Agriculture?—Yes; all the agricultural education in the Victoria University is given at Yorkshire College, Leeds.

4246. And there is a Professor?—Yes.

4247. You yourself filled that post?—Yes.

4248. And you taught classes and delivered lectures in Agriculture?—Yes.

4249. Professor DICKEY.—How many years does the course cover?—At Glasgow, three years, and at Leeds three years also, provided the student takes his preliminary examinations before he enters the College. If, however, he studies in the College for the preliminary examinations then he must take a four years' course at Leeds.

4250. Dr. STARKIE.—The preliminary examination is an Arts examination?—Yes; but a very substantial course in Arts is not necessary.

4251. Professor LORRAIN SMITH.—Does the Glasgow degree involve attendance at College?—It involves attendance at the University. At Glasgow five out of the twelve Science subjects must be taken at the University, and seven may be taken at recognised Colleges outside the University. The course of study at Aberdeen and Edinburgh is practically the same, and leads to the same degree.

4252. Mr. Justice MADDEN.—As at Glasgow?—Yes. Durham University prescribes a somewhat similar course of study, except that the Arts examination may be taken any time before graduation.

4253. And there is a Professor of Agriculture in Durham?—Yes, at the Durham College of Science. In the University of Wales agricultural education is provided at Bangor and Aberystwith. At both places there is either a Professor or a Lecturer on Agriculture, and agricultural students may obtain a degree. The degree course resembles that at the Victoria University rather than that at Glasgow. Cambridge has quite recently recognised Agriculture, and the Pure Sciences having a bearing on that subject have been added as a special subject for a degree.

4254. For what degree?—The B.A. degree. The University grants a diploma in Agriculture, Part I. of which is in Pure Science, and Part II. in Applied Science. Part I. only is included in the subject for the degree, which is, therefore, less of a degree in Agriculture than the degrees at the other Universities I have mentioned. The number of students reading for a degree at the various Colleges will doubtless interest you. The number of students attending the degree courses in 1899-1900 were:—At Aberystwith, 3; at Bangor, 3; at the Yorkshire College, 4; at Durham, 5. So you will see that while there has been ample provision for higher agricultural education it has by no means been largely availed of. While there are some eight centres providing higher University instruction in Agriculture, one could easily supply the demand.

4255. Professor DICKEY.—These are the numbers who got degrees?—No; these are the numbers who were reading for degrees, comprising first, second, and third years' students.

4256. Dr. STARKIE.—What about Cambridge?—The Cambridge degree is not strictly an agricultural degree. There is a diploma in Agriculture, and the first part of that diploma, which is in Pure Science, forms a "special" subject for the B.A. degree.

In addition to the degree courses there is, at most of the collegiate centres, a course for a diploma, and this is much better attended. The preliminary examination prevents agricultural students going forward for the degree course. Farmers are intensely practical, and they cannot see the necessity of allowing their sons one year to study Latin, Mathematics, English, or a modern language before they begin their agricultural studies.

4257. Mr. Justice MADDEN.—Do you attribute the failure of the agricultural classes to the fact that a preliminary qualification in Arts is required?—That is one reason.

4258. Are there any other reasons?—Another is that it is only a few students who are preparing for special employment that really find the degree useful. The practical farmer cannot afford to allow his son sufficient time from the farm to take a degree.

4259. The degree is chiefly valued as a qualification for some appointment?—Yes. Very rarely do you find a student going back to the farm after he has taken a degree. A College diploma in Agriculture can be got in two years; consequently, the student who is to farm does not spend an additional year to take a degree. He omits the first year's study for the degree which has no direct reference to Agriculture. The farmers of Great Britain will not send their sons to College even for one year unless they are to be taught something which will assist them in their business. After a few years of higher agricultural education there was some disappointment caused by the small attendance at the classes. A demand, then, arose for short courses in agricultural subjects, and these have been fairly successful. The short course extends, say, from six to ten weeks, in winter.

4260. Professor LORRAIN SMITH.—You have not told us about the number of students attending the diploma courses?—I have overlooked that. Perhaps it would be well if you added two columns to your notes of the figures I have already given you: one for the number of students attending the diploma course, and one for the number of students attending the short course. The figures are as follow:—In 1899–1900, at Aberystwith there were 3 students reading for the degree, 8 for the diploma, and 51 attended short courses; Bangor had 3 students reading for the degree, 6 for the diploma, and 22 attended the short course. At the Yorkshire College there were 4 students reading for the degree, 43 for the diploma or general course, and 3 attended special or short courses. The short course at Leeds was for special work. At Durham College of Science there were 5 students reading for the degree, 4 for the diploma course, and 17 attended short courses of agricultural instruction. You will see, therefore, that there was considerable demand for short courses of agricultural instruction.

4261. Professor DICKEY.—Can you give us details as to the Scotch Universities?—I have not been able to lay my hands on the figures for Scotland. Those I have given you are taken from the Report issued by the English Board of Agriculture. That Board no longer deals with agricultural education in Scotland, and the Report of the Scotch Education Department does not appear to supply the information. But the figures for the Scottish Universities do not materially differ from those which apply to England.

4262. Mr. Justice MADDEN.—From your own knowledge the attendance is poor?—Yes; except at the short courses. At Glasgow and Edinburgh short courses are held, not in the University, but in extra mural schools, and there they are fairly well attended. At Aberdeen they are held in the University. To put it shortly, there has been a poor demand for University Education in Agriculture, but a fairly good demand for short courses of useful information.

4263. The course results in a diploma. How many years' study does it cover?—Usually two years. It is not for the diploma of the College that students work mainly, but for the National Diploma in Agriculture.

4264. In the College?—No; the National Diploma is granted jointly by the Highland and Agricultural Society of Scotland, and by the Royal Agricultural Society of England.

4265. Do the courses in the College qualify for this diploma?—The courses qualify for the College diploma, which is not regarded as of much consequence, and also for the National Diploma, which is highly prized by the students. Their ambition is to obtain the National Diploma, for which the examination is held in Yorkshire College once a year for students from all Colleges. This is the diploma formerly granted by the Highland Society of Scotland and by the Royal Agricultural Society of England. These societies now jointly give a diploma in Agriculture.

4266. What does the short course eventuate in?—The short course covers a period of from six to ten weeks, and is merely for the purpose of supplying useful information.

4267. Does that instruction eventuate in a diploma?—No. The course is too short. Sometimes, however, students return for a second short course. These courses are valuable, but it is impossible to really make them educational. The students learn certain formulae and useful hints to enable them to spend money to advantage in the purchase of farm requisites, or to reap more from the land, and in this the short courses have done a great deal of good. To a great extent they have helped to destroy the prejudice that existed against agricultural education. Farmers have too often believed that agricultural education was merely book education and not practical, but the practical and useful character of the information given in those short courses has helped to destroy the idea to a considerable extent. But the University is not the place for short courses; they should be given in a Technical or Agricultural School. Now, with regard to the counties that did not join in supporting a collegiate centre. For the most part, they started a system of itinerant instruction in Agriculture. I take Cheshire as an illustration. There have been two itinerant instructors there since 1891. For a time, I believe, there were four. The itinerant instructor aroused a considerable amount of interest, and by means of lectures and demonstration plots he stimulated a desire for scientific knowledge. Farmers began to see that there was something in agricultural education, that it was not merely book knowledge, and gradually the need for an agricultural education for their sons arose which ended in a County School of Agriculture being started in 1895 at Holmes Chapel. Youths now go there either directly from the Board School or from the Grammar School. They generally remain for three years and return to their fathers' farms, or, in a few cases, they pass on to the Universities. Out of the 100 students that went through the College for the last five years four have gone to the Universities. I intended to refer here to the National Diploma in Agriculture. I think, however, I have already indicated the part it plays in agricultural education in Great Britain. I will merely repeat what I have already said. It is a diploma jointly granted by the Highland and Agricultural Society and by the Royal Agricultural Society of England. That diploma is looked upon as being of considerable value to the students, and takes the place of a degree for those students who are unable to master the preliminary examination.

4268. Mr. Justice MADDEN.—In view of some appointment?—Yes.

4269. What class of appointment?—A teacher of Agriculture in a College, an itinerant instructor in a county, or a land agent. There are two examinations—one in each year. The first is mainly Pure Science, and the second Applied Science. You will now understand that in Great Britain University Education in Agriculture has not been a great success, but that there has been a growing demand for more practical agricultural education of a type suited to the Technical or Agricultural School. I may mention that of late years a demand has arisen for rural studies in Elementary and Secondary Schools under the name of Nature Knowledge. So long as it is restricted to Nature Knowledge it will do good, but I very much fear that schoolmasters, not being trained to teach "Nature Knowledge," will, instead, attempt to teach something in the nature of technical Agriculture or Horticulture. No boy should be taught technical subjects until he is at least thirteen or fourteen years of age. What I have said so far refers to England and Scotland. Turning now to Ireland, it is not my intention to follow the somewhat fitful fortunes of agricultural education there, because some of you, no doubt, are better acquainted with it than I am. When the Department of Agriculture was instituted they found no provision for higher agricultural education in the country. At one time, I understand, there was a Chair of Agriculture or a Lectureship in Agriculture in each of the Queen's Colleges, and also, I believe, in the Royal College of Science, but as yet I have not found any trace of their teaching. Under the Commissioners of National Education, Agriculture has for a long time been taught in the National Schools. The history of this is, perhaps, also better known to you than to me. I merely wish to state that only two institutions in which Agriculture is taught were handed over to the Department, viz., the Albert Institute, Glasnevin, and the Munster Institute, Cork. The Albert Institute has had a varied history. It was originally built to provide instruction in Agriculture for schoolmasters. When taken over by the Department its function was to provide a summer course of instruction in Agriculture for male students. The course lasted eight months, the fee being £15. There were twenty-five free places, but even with this the School was not crowded. But there was a good attendance—up to fifty. There were also winter courses for young women in Dairying and Domestic Science. There has been a very good demand for education of that kind. As to the Munster Institute courses in Agriculture have also been given there to young men. These courses have not been a success. At the Munster Institute instruction is also given to women. The Secretary of the Department of Agriculture has no doubt indicated what the Department intends to do to provide Agricultural education in Ireland. The Department's first duty is to provide for higher instruction in Agriculture. One institute will suffice for this. Without that it would be quite impossible for the Department to proceed with their programme, which includes the appointment of a number of county itinerant instructors—men who have had a special training not only in Agriculture, but in the sciences bearing on Agriculture. Now it is proposed to use the Royal College of Science for the training of these men in the sciences bearing on Agriculture as well as in the application of these sciences to Agriculture. A Faculty of Agriculture is being added to that College, and

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considerable progress has already been made in providing it. Scholarships were offered last year, and this year more Scholarships have been provided for young men who had been accustomed to farming from their youth. They were admitted by competitive examination, which comprised English, Mathematics, and Practical Agriculture. By-and-by it is intended to add to that a knowledge of a language. Thirteen students are now in training, and six of these are in their second year. In this connection I wish, if I may be allowed, to refer to the evidence given by the Most Rev. Dr. O'Dwyer, and to point out that the course of agricultural instruction at the Royal College of Science extends to three years, and not one year as his lordship had been informed. The first year will be devoted mainly to Chemistry, Physics, Mathematics, and Drawing; the second year to Botany, Zoology, and Geology, and their applications to Agriculture; and the third year will be entirely devoted to Technical Agriculture. The Albert Farm will be used in connection with the Royal College of Science as a demonstration and experimental farm. The three years' course will, doubtless be extended to four years as soon as the present pressing demand for agricultural instructors ceases.

4270. Mr. Justice MADDEN.—What you look forward to is the training of agricultural instructors?—That is one object.

4270A. Do you look forward to this course as a training for men who themselves would be farmers?—I do not look forward to the Royal College of Science training farmers. The same thing would happen in Ireland that has happened in England and Scotland, only more so. Young men who are to be farmers will not attend a Technical College. In Ireland farmers cannot afford to send their sons to a three years' course of instruction in Agriculture.

4271. But you say that the College will train some class besides teachers?—The Department require trained experts to undertake investigation. We hope to see the fourth year devoted to research in Agriculture.

4272. The College will, therefore, train men in research and also as teachers?—Yes; these are the main objects. There is also a demand for teachers and agricultural experts outside Ireland, but, unfortunately, the student who takes his course at the Royal College of Science will be under the great disadvantage of not having a degree when competing for these posts. Rightly or wrongly, great weight is placed on a degree, and a man who holds a degree in Agriculture, when competing with a man who has not, will possess a great advantage. There is no doubt about that. I have referred to the number of students who will probably attend the Agricultural Faculty in the Royal College of Science. At present there are thirteen. The course was advertised this year, and notwithstanding the fact that young farmers in Ireland must know that there are now good openings awaiting those who have had a good training, there is not a single student of Agriculture attending and paying fees. Those who are studying obtained Scholarships.

4273. You mean thirteen have been provided with Scholarships?—Yes.

4274. How many Scholarships were there available?—Thirteen.

4275. Most Rev. Dr. HEALY.—What is the value of the Scholarship?—Free education and a guinea per week as maintenance allowance—the same as is given at the Royal College of Science in London.

4276. Mr. Justics MADDEN.—Obtained by competitive examination?—Yes.

4276. What are the subjects?—English, Mathematics, and Practical Agriculture, and it is intended to add to that a language, but for the present it is not possible to find young men who have spent some years on a farm who are able to pass an examination in Latin or a modern language, and unless the students have had a good training in Practical Agriculture they are of no use to the Department. The son of a tradesman or a boy from a town could not do the Department's work.

4277. You have called attention to an important suggestion in reference to the College of Science, namely, that students of Agriculture should be able, by attendance at the course of instruction given in the College, to obtain a degree. What is your practical suggestion as to how that should be done—is it by the affiliation of the College to a teaching University, or by the recognition of it by such a University?—It might be done in either way. What I wished to bring out is the fact that the attendance of students at the College would be increased if they had the means of getting a degree. If a University recognised Agriculture, my suggestion is that in the first year the student should take a preliminary course in Arts; in the second year he should study Pure Science; in his second and third he should take Technical Agriculture at the Royal College of Science, the courses being recognised by the University, and that body would then examine the student in Agriculture and agricultural subjects and give him a degree. I think that would undoubtedly attract more students to the College. There are many good posts which would then be open to them, which are at the present time closed to them, and will always remain closed to them until they can obtain a degree.

4278. Professor LORRAIN SMITH.—You mean the degree of B.Sc.?—Well, that is the degree given in Scotland and England. That is the degree that would be, in my opinion, of most practical use to a student of Agriculture. Now, what I have already said refers to higher instruction in Agriculture, but I may be allowed for a moment to state what the Department propose to do with regard to providing a more general education in the subject. It is quite evident that, if agricultural education is to be of any material benefit in Ireland, it must filter down to every district and every parish in the country; and the proposal of the Department is that, by and by, there should be at least one Winter School of Agriculture in each county—perhaps more than one in some counties. I will explain what I mean by a Winter School of Agriculture. Suppose a boy leaves a National School at the age of, say, thirteen or fourteen, and that, for the next two years, he attends a Secondary School, equipped with laboratories and workshops. He would then have arrived at an age when he would be absolutely indispensable on his father's farm—indispensable, however, only in the summer, or from seed-time till autumn. During the winter, if kept at home, he would probably be idle, and would be a great deal better continuing his studies at school. Now, if there was a Secondary School in his district, equipped as I have indicated, it would be a simple matter to add to it an additional room and a first-class agricultural instructor. Here the youth could in winter attend a course of instruction, not by a schoolmaster, but by an expert agriculturist from whom he could learn something which would be of use to him in after life. I believe it would be possible in that way to provide a really practical education in Agriculture, which would be useful to, and would be availed of, by a large number of youths.

4279. Mr. Justice MADDEN.—What you have suggested is very interesting and important, but I wish to point out to you that it is hardly relevant to the subject we have to deal with—that of University Education, except so far as it might afford a link between Secondary Education and University Education?—My object is to show that instructors are wanted, and, therefore, a place for higher education to train them. To further develop the point, I may be permitted to state that the Department are training itinerant instructors in Agriculture—young men who will meet farmers on their fields in the daytime, and in the local schools in the evening, and discuss with them practical problems; in fact, to carry on a sort of mission work among them, to give them those formulae I have spoken of, to demonstrate the truth of these formulae by putting them in actual practice on a demonstration plot; in short, to supply useful information, which will enable farmers to make more out of their land, to buy cheaper and to more advantage. This will create a demand for the education of farmers' sons, and pave the way for the Winter School. Nine counties have already made a start, but the difficulty the Department have to contend with is the lack of suitable instructors—instructors qualified to give technical instruction in Agriculture. I want you to understand clearly the function of the itinerant instructor in Agriculture. It is not to teach "Science" to farmers. That would be an utter mistake. Imagine, for instance, an agricultural instructor going to an Irish fair, and attempting to deliver a scientific lecture to farmers. The very idea is absurd. The teaching of Science is not the business of the instructor in Agriculture. His duty is to assist the farmers on points where their knowledge is at fault; how, for example, they can buy and use manures or feeding stuffs to the best advantage, where to get good seed, what kinds of seed to buy, the best implements for their purpose, and so on. But while the Department does not want the instructors to teach the farmers Science, all instructors should have themselves re-

ceived a thorough grounding in Agricultural Science, and to show the farmers, practically, how that Science can be applied, so as to make the most out of their land. Just as a physician advises his patient what he must do to recover health, but does not detail the scientific reasons by means of which he has arrived at his conclusions, so the instructor in Agriculture advises the farmer how to proceed under a special set of circumstances without giving detailed scientific reasons. I wish now to indicate the future of the Albert Institute at Glasnevin, and also that of the Munster Institute at Cork, and what is to be done at these Institutes for Intermediate Agricultural Education. There is, at the present time, a certain demand in Ireland from farmers to have their sons trained in Agricultural Science. At the Glasnevin Institute twenty-five Scholarships are offered to farmers' sons, and instruction is given annually to about fifty. From fourteen to twenty male students receive instruction in the Munster Institute, Cork. I have said that there is a certain demand by farmers in Ireland for the class of agricultural education given at these centres. The Department do not intend to destroy that demand; they intend to encourage it, and to provide for it, by making the Albert Institute at Glasnevin entirely an institution for male students, and the Munster Institute at Cork entirely for females. There are obvious advantages in this. It will prevent the duplication of the staff and appliances at the two institutions. The Department does not anticipate that, for the present at all events, the Albert Institute will be unequal to supply the demand.

4280. But the students in those institutions are not exactly University students?—No; they are sons of farmers.

4281. And it is not contemplated that they should go to any University?—It is not.

4282. So that this does not come within the scope of our inquiry?—I suppose you mentioned it in order to show the demand that exists for higher University Education?—Yes.

4283. And the consequent demand for teachers?—Yes.

4284. With reference to Scotland, you are, of course, well acquainted with it. There is a class there of very large farmers—in fact, in some parts, they regard a farm of 300 or 500 acres as a small farm?—Yes, in some parts.

4285. Do the sons of that class of farmers attend the Scottish Universities to any considerable extent?—No, not to any great extent. As a matter of fact, the students who attend the Universities come from the poorer parts of Scotland.

4286. Do you think that in Ireland there is any considerable class of farmers who would be anxious to avail themselves of an opportunity of securing for their sons a higher class of Technical Education—supposing a College or University were established in Dublin, where they could obtain a certain amount of general culture, together with a special education in Agriculture?—And return to their farms afterwards?

4287. Yes?—I do not think there is.

4288. You are aware, and you have kept in view throughout your evidence, the fact that the subject of our inquiry is that of University Education in Ireland?—Yes.

4289. Have you any practical suggestions, beyond what you have already offered, with regard to the future: assuming that a teaching College or University were established in Dublin, and assuming the College of Science to be developed and extended in the way pointed out. Have you anything to suggest as to the relations that ought to exist between such a University or College in Dublin and the College of Science?—Well, my knowledge of University Education in Ireland is, of course, somewhat limited; but what I suggest would be some relation between the Royal College of Science and a University, whereby a student could take one year in Arts and a second year in Pure Science, in that University, and then go to the Technical College—that is, to the Royal College of Science—and there get a two years' course in Technical Agriculture, which could be recognised by the University as qualifying for graduation.

4290. And that should be the degree of B.Sc.?—Yes. I may state I do not forget the fact that the Royal University of Ireland grants a diploma in Agriculture; but I think I may safely say that that diploma will never be a success: it will never possess the same value as a degree.

4291. Will you kindly give your reasons for that opinion?—My chief reason is that there is already in existence a National Diploma, and that diploma has now come to be of considerable value. Any student who could obtain the diploma of the Royal University would undoubtedly prefer to take the National Diploma, and in comparison with it the diploma of the Royal University would be little known, and not valued. I am not at all saying that the course prescribed for the diploma of the Royal University is deficient; on the contrary, in my opinion, it is a very substantial course.

4292. In your opinion the diploma of the Royal University would not attract students?—Yes.

4293. In fact, what we may call the higher agricultural education has hitherto been adopted rather as a means of obtaining certain appointments than for any other purpose?—Quite so.

4294. Do you look forward to that state of things as continuing?—I do.

4295. You think our movement should be chiefly directed towards providing for the education of a body of local instructors in Agriculture, giving them, superadded to their Technical Education, a certain degree of University culture?—Yes.

4296. Most Rev. Dr. HEALY.—There is one thing you are clear upon: that it would be of importance to give facilities for agricultural students of the higher grade to obtain a degree?—Yes.

4297. You have suggested also how that might be done. I don't propose to examine you upon that point at present; but I wish to ask you whether you do not think that agricultural education generally in Ireland is in a very backward state?—Do you mean agriculture, or education?

4298. I mean both?—Undoubtedly agriculture in Ireland is in a backward state.

4299. And the education also?—Yes.

4300. Don't you think it would be desirable to let agricultural education filter down, as far as possible, to the farmers in Ireland?—Certainly.

4301. I presume you are of opinion that a system of agricultural instruction, carried out by a body of itinerant instructors, can never be systematic teaching?—Certainly not.

4302. And that education which is not systematic cannot be of much permanent value?—I do not quite agree with you as to that.

4303. At all events, itinerant instruction is not of as much value as systematic teaching?—It is not.

4304. I take it that you would be of opinion, in order to establish a system of systematic teaching, that it would be desirable that, in every parochial area—by parochial area I mean a district in which every grown-up boy could walk and return home the same day—to have a school, say, within a radius of three or four miles. In that school there might be two sections—a literary section, with a literary teacher, paid by the Commissioners of Education, and also an agricultural section, with a teacher of Agriculture, who would teach agricultural work in the fields, and paid by the Agricultural Department. Don't you think that that would be a feasible way of bringing agricultural education home to the farmers' sons in the country?—It would depend on the previous training of the boys.

4305. I mean for boys who have already gone through the ordinary National School course—I want your opinion how far a number of schools of the character I have described would work for the promotion of agricultural instruction in the country?—My further difficulty in answering your lordship is this: I do not know the age of the boys. A boy usually leaves the National School at about twelve or thirteen, and I do not think it would be desirable to attempt to teach technical agriculture to boys of that age.

4306. I think they should be at least fourteen. Don't you think such a course of instruction would be useful for boys over fourteen if you got good teachers?—Yes, if their previous training had been good; that is, in fact, part of my suggestion about Winter Schools of Agriculture.

4307. But if that scheme were to be fully carried out you would require to have a great many schools—you would want about 1,000?—A scheme of such magnitude would have to be put in operation with great caution.

4308. If the scheme were to be carried into effect you would have about 1,000 districts, and would want 1,000 teachers; and you would require to have institutions for training them in the provinces. Now, supposing you had a place like the Queen's College, in Galway, where you have a splendid building, a considerable sum of money for keeping it up, and a body of competent

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scientific Professors, don't you think that such an institution, besides maintaining its present position as a University College in Arts, might also have an agricultural side, which could be utilised for training a body of teachers for giving agricultural instruction in those parochial schools throughout the country?—I don't think students of Agriculture would attend the Galway College.

4309. I am speaking of persons who wished to be trained as teachers—men who desired to become teachers would have to go?—Would they be sons of farmers?

4310. Yes; men who would be steeped in Agriculture from boyhood. You may be sure those farmers' sons who were desirous of becoming teachers in the schools would go to the College, to be trained as teachers, and would make excellent teachers?—I don't think they would make any better teachers of Agriculture than the present National School teachers.

4311. The present National School teachers know nothing at all about Agriculture. Would not farmers' sons make better teachers? What is there to prevent them becoming teachers? Suppose a farmer's son, who has been on his father's farm, goes to the Galway College, and studies Agriculture, and gets his diploma, would not that provide an excellent body of teachers for the parochial schools I have described?—Well, my lord, the Department of Agriculture have already offered to train farmers' sons as teachers with very much better prospects than you describe, and yet the number who have availed themselves of it has been very limited.

4312. Is there any demand for teachers at present? Will you tell me where there is any Agricultural School in the country at the present moment? Is there a single one, from Malin Head to Cape Clear?—There is the Royal College of Science.

4313. That is not a school of the kind I mean. With that exception, is there a single Agricultural School in the whole country?—There is the Albert Institute, Glasnevin.

4314. I want to create a number of Agricultural Schools, to diffuse agricultural instruction in the country, and I have suggested a way of doing it, and I say you can obtain good teachers by having, not only in Dublin, but in Galway and in Cork, Training Colleges for such teachers?—May I ask whether, in the school your lordship has outlined, the teacher would be expected to give instruction in any subject besides Agriculture?

4315. He would teach Agriculture. There would be two teachers in each school. There would be, first, a literary teacher, who would instruct the boys in subjects bearing on Agriculture during the forenoon; and in the afternoon the agricultural teacher would take them on a farm, and give them practical instruction in Agriculture; and I would suggest, if you want the schools to be a success, that you should pay them 1*d.* or 1½*d.* an hour for every hour they worked on the farm. If you do that, you will, in my opinion, have a successful Agricultural School; if you don't, you will not. I want to know, don't you think that Galway College might be utilised in that way, by having an Agricultural Branch, for the training of teachers?—Suppose the Commissioners of National Education were to start and help to maintain a certain number of those schools, then, undoubtedly, there would be some room for an Agricultural College in Galway. But the scheme you have put forward, of having 1,000 such schools, would involve an expenditure that would, I fear, prevent its being carried out. What, in my opinion, there is room for in Galway is an Agricultural College for providing short winter courses such as I have described as being successful in Great Britain.

4316. The people of the country have a desire for knowledge, and you must bring it home to them by schools within their reach, even a few to begin with and encourage them in every way to attend those schools?—Well, my opinion is that you can only bring the need for agricultural education home to the farmers by showing them that education means money to them.

4317. That is when you are dealing with grown-up farmers, but you can take the younger men—you can educate them?—That is so, but we must bring home the need of agricultural education to the farmers of Ireland before they will send their sons to an Agricultural School. I quite agree that we must deal with the rising generation.

4318. Mr. Justice MADDEN.—It is with this in view that you contemplate the establishment of the Winter Schools?—Yes. I don't think there is much difference of opinion between his lordship and myself, except as to the number and character of the schools.

Dr. STARKIE.—The National Board have got no funds for establishing such a number of schools.

4319. Most Rev. Dr. HEALY.—I would be satisfied with 1,000 as a maximum?—I don't think it could possibly be done. I believe if the Department were to provide the short winter courses in agricultural teaching that I have suggested, a considerable number of students would attend them.

4320. Professor DICKEY.—You referred to the Queen's Colleges having had Chairs of Agriculture at the start, and that they were abolished. I suppose the principal reason was that there were no schools to educate boys up to the standard of the Colleges?—Well, I do not know the cause. I merely know that there were Professors of Agriculture in the Colleges, and that now there are none.

4321. Would not it be a reasonable explanation of it, that there were no schools in existence, which could prepare boys, and fit them for receiving and taking advantage of the lectures of the Professors of Agriculture in the Colleges?—That might be one explanation; another might be that the course was unpractical.

4322. If you had such schools, would not there be a demand created for the higher Collegiate Education?—I do not think so. I do not think there will ever be a general demand for a higher education in Agriculture in Ireland—that is, for education of a University standard.

4323. Where do you propose that the teachers of Agriculture for those winter courses should be trained?—I propose to train them and other students of Agriculture in the Royal College of Science.

4324. Would you give the students of Agriculture a degree?—Yes; if it can be arranged, provision should be made for giving them a degree.

4325. Mr. Justice MADDEN.—Would that be the degree of B.Sc., or do you propose that there should be a degree in Agriculture?—What I suggest is that there should be a degree in Science, and that Agriculture and Agricultural Science should be included in the subjects qualifying for the degree.

4326. Professor LORRAIN SMITH.—I presume that, if a University were created in Belfast, you think it would be desirable to have provision made for agricultural education there?—Ulster is as much in need of education in Agriculture of the kind I have described as the other provinces.

The Witness withdrew.

The Commission adjourned until the following morning.

ELEVENTH DAY.

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WEDNESDAY, NOVEMBER 27TH, 1901,

AT 10.30 O'CLOCK, A.M.,

At the Royal University of Ireland, Earlsfort-terrace, Dublin.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT. D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

J. H. REYNOLDS, Esq., Principal of the Municipal School of Technology, Manchester, examined.

J. H. Reynolds, Esq.

4328. Mr. Justice MADDEN.—Mr. Reynolds, you are Director of Technical Instruction and Principal of the Municipal School of Technology in Manchester?—I am.

4329. You are aware that we are inquiring into the subject of Technical Education in Ireland?—Yes, I am so aware.

4330. With special reference to University Education?—I am so informed.

4331. May I ask where did you yourself receive your education?—I received my education at an elementary school.

4332. In England?—Yes, in England.

4333. Therefore, I suppose your experience with regard to Technical Education has been almost entirely practical experience in England?—Yes. I have been for twenty-two years connected with such work, first as secretary of the Mechanics' Institution in Manchester, which was a very successful institution, and which ultimately, in 1883, was converted into a technical school, and in 1892 was taken over by the Corporation of the city of Manchester with a view to its being conducted as a municipal technical school, and with the intention of developing it and erecting new buildings for the purposes of technical instruction.

4334. I gather from the summary of your evidence that you have also given special consideration to the provisions made on the Continent for Technical Education?—Yes. I have been twice on the Continent, making a tour of inspection, and I have been once to the United States. Besides that, I have travelled up and down the United Kingdom gathering experience of other technical institutions.

4335. Will you, in your own language, give us information as to the constitution of your Technical Instruction School, and the work done by it?—Yes. When the Technical Instruction Act of 1889 was passed, the City Council of Manchester immediately adopted it; it was, in fact, the second authority in the Kingdom to adopt the Act. They proceeded to take powers to levy a 1*d.* rate, and to distribute it in certain proportions among institutions in the city of Manchester. Among those institutions was the Mechanics' Institution, to which ultimately they gave £4,000 a year. They gave help also to the Manchester School Board and other institutions, including the Manchester Grammar School. When the Act of 1890 was passed, giving local authorities some share in the Residue Grant, which, at that time, amounted in Manchester to about £14,000, they felt it desirable to take over the Mechanics' Institution, which by that time had passed into the hands of the Whitworth Institute of Art and Industry, a new body, which took upon itself the provision of technical and art instruction in the city prior to the passing of this Act. This body considered that it no longer lay within its province to do this work, and asked the City Council to take over the School of Art and the Technical School, which the City Council did, and thereupon proceeded to form a committee consisting of twenty-four members of the City Council, and twelve co-optive members representing the industry and the commerce of the city. These gentlemen, in fact, were previously members of the Committees of the School of Art and of the Technical School. The Committee set about at once making inquiries as to the provision for technical instruction in England and abroad, with a view to the building and the establishment of a municipal technical school. They still continued their assistance to other bodies, and at this time included also the Owens College as a body to which they would give assistance. The work of building and establishing this new Technical School has gone on since that time; in fact, the new Technical School is now in its seventh year of construction, and the Committee expect to be in full possession of it, and have it in full operation in the course of two or three months from the present time. The resources of the Committee are the 1*d.* rate, which, in Manchester, realises £12,500, and the Residue Grant, which last year reached £18,000. They have, in view of their large engagements, in a general Act, which will be before Parliament next Session, asked for power to increase the 1*d.* rate to 2*d.*, which has been already granted in the case of one or two other towns in England.

4336. I suppose that of all these different institutions the Owens College is the one most nearly connected with our present investigations?—That is so.

4337. It is affiliated with the Victoria University?—Yes.

4338. It would be very interesting if you were to tell us of the work done by the Owens College in connection with the Victoria University, and to explain its relation to the University. Is it not a College of the Victoria University?—It is a College of the University.

4339. In the first place, perhaps, you would commence by telling us the nature of the actual teaching work done by the Owens College?—Of course, I speak of the Owens College only as an outsider, and must not be taken to represent it.

4340. I understand that?—I mean I do not want to commit the Owens College to any mere opinions of mine.

4341. What we should value on this particular point is a statement of the actual work done, of the character of the work, and of the relation of the College to the University, which, of course, gives degrees?—Yes. The Owens College provides courses of instruction in Science, in such subjects as Chemistry, Physics, and Engineering for students who desire degrees, and they prepare students to take positions of efficiency in connection with the chemical industries or in the engineering industries. But do I not rather gather from you that you would desire to know its relation not so much with the University, which, after all is merely a degree-giving body?

4342. Perhaps you could inform us on this subject: Are the examinations for the degrees conducted in the Owens College?—They are conducted in the Owens College, but they are conducted by the University.

4343. By University examiners?—By University examiners, some of whom are external, by the lecturers of the University, or the Professors of the University and the Professors of the College conjointly, and those examinations apply equally to Liverpool and to Leeds; so that the degree-giving body is not the College, but the University itself, which controls, so far as examination can control, the teaching of the Colleges of the University.

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4344. What is the Governing Body of the Victoria University?—It consists of a University Court comprised of persons appointed under the statutes, and including persons elected by the various Colleges; but you will have before you, no doubt, persons who can speak with more authority than I can of its constitution.

4345. But the teaching is done in the Owens College, and the examining for the degrees is conducted under the authority of the University by examiners—some outside examiners, and others the teachers in the Colleges?—Yes.

4346. And the degree is the degree of B.Sc.?—The degree is B.Sc.—that is the ordinary degree, or the honours degree. If a student obtains the B.Sc. or the B.A. degree with honours the title of M.Sc. is ultimately conferred upon him, or M.A., as the case may be; and the degree of D.Sc. can also be obtained in connection with certain defined courses of study.

4347. I presume that Practical and Technical Education forms only a part of the curriculum for the degree of B.Sc.?—For the degree of B.Sc. a student, say in Chemistry, would probably enter the Honours School, where he would take his courses in Mathematics and Physics, but mainly the subjects of Chemistry. And so with Engineering, and so with Physics.

4348. Can that degree be obtained by a student in the Owens College—the degree of B.Sc. of the Victoria University—who does not go through the Arts course?—Yes; that is to say, he passes a preliminary examination, which includes Mathematics and English, including Language and History, as compulsory subjects, then three of a range of subjects, one of which must be a language, either Latin, Greek, French, or German; then Chemistry, Physics, Mechanics, Geography. Having passed that preliminary examination, he can enter, if he be a chemical student, the Honours School of Chemistry.

4349. Is that preliminary examination passed on his entrance to the Owens College?—It may be passed before entrance to the College, or it may be passed within a year of entrance, supposing the student intends to graduate.

4350. But when a preliminary examination of such a character has been passed, is the student at liberty to specialise?—He is at liberty to specialise either in the School of Chemistry or in the School of Physics and Mathematics, or in the School of Engineering. But there is an Arts course besides.

4351. That we understand. Now, is what I may call the Technical School or the Practical Science side of the Owens College largely attended? Are there many students?—I would not say that it was largely attended. The total number of students at the Owens College is between 1,100 and 1,200. Of these 1,100 or 1,200 only a certain proportion are students who ultimately take their degrees. Some of them are Arts students, some of them are Science students, and some of them are students of the day Training College for Schoolmasters and Schoolmistresses, many of whom are attending the College with a view to taking their B.A. or B.Sc. degree.

4352. Is there any further information with regard to the Owens College and the Victoria University that you think would assist us in our inquiry?—Well, sir, the Owens College is making a great effort to bring the highest fruits of scientific education and instruction in relation to industrial pursuits in Manchester. They have recently fitted up a very fine Physical laboratory, which is, from the point of view of English institutions, exceedingly well equipped. There is also large provision in the College for the teaching of Inorganic, and especially of Organic Chemistry in relation to the chemical industries.

4353. What classes of employments or professions do the students in that side of the Owens College usually adopt?—Some of them attend the College with a view to becoming teachers of Science; others of them, no doubt, enter into responsible positions in connection with the local industries, either chemical or engineering. The College is largely assisted by a great number of scholarships offered by Technical Instruction Committees in Lancashire and in Cheshire, which bring to the College students mainly recruited from the industrial class, who, having obtained a certain education, are enabled to enter upon the teaching given by the College in Chemistry or in Engineering or other branches of Science.

4354. Is there any system of exhibitions or bursaries in the Owens College by means of which promising pupils from the Primary Schools or from the Secondary Schools may be brought into the University system?—Yes; the College has a large number of scholarships and exhibitions, which are competed for by pupils in Secondary Schools, and in what are called Higher-grade Schools, or Schools of Science, in the district which the College covers. Besides that, as I just now said, various Technical Instruction Committees themselves offer scholarships which are tenable by this class of students at the Owens College.

4355. For how many years has the Owens College been in existence?—Since 1850.

4356. And for how long has this Technical Education side been developed to the extent to which you refer?—More or less all the time.

4357. Before I pass, Mr. Reynolds, to the portion of your evidence dealing with Technical Education abroad, I would ask you whether you could add anything to what you have already told us derived from your experience at home, bearing in mind that what we are dealing with is University Education, and Secondary and Primary Education only so far as it is connected therewith or leading up to it. There are some suggestions in your Summary as to what is required in the way of organisation?—The position in Manchester is somewhat peculiar, because of the enterprise and activity of the Municipal Council. We are building, or have built, a Municipal School of Technology. We have advisedly taken that name to distinguish the School from a school which is merely technical, and which concerns itself chiefly with the art of doing a thing rather than with studies which show the application of scientific principles to industrial processes. This has brought about a state of things in the city which, in the estimation of some people, appears to place the School in collision with the work of the Owens College. The object of the Committee was to create in Manchester an analogue of the German technical high schools, and, as, no doubt, you gentlemen know better than I do, such schools are of University rank in Germany. I speak of such schools as those at Charlottenburg, or Darmstadt, or Hanover, or Aachen, or any other of the numerous technical high schools in the German Empire.

4358. Professor LORRAIN SMITH.—When you say they are of University rank, what exactly do you mean?—I mean that the teaching is on the same plane as University teaching.

4360. Mr. Justice MADDEN.—You were dealing with the School of Technology?—Yes. My only point is to explain the position of the Municipal School of Technology. You told me you were discussing this question from the point of view of University Education.

4361. Yes; and with special reference to suggestions which have been made for either affiliating or utilising schools somewhat analogous to the School of Technology, such as you describe it?—That is a point I wish to bring before you. The object of the Committee in establishing this School is to put it on such a plane, so far as its teaching is concerned, that it shall be recognised as giving for industrial purposes the very highest class of scientific instruction. That is their object. To that extent it might be held to come into collision with the work of the University Colleges, such as the Owens College. It is not in any sense the desire of the Committee to come into collision with the work of the Owens College. Our aims are necessarily more direct and more practical than is the attitude, generally speaking, of a University College. Whatever science we teach is distinctly with a view to its practical application, and the Committee feel that in a city like Manchester the instruction in Science as applied to industry should be of the highest order. To that extent they put themselves on the same plane as the work of the University Colleges. It may reasonably be hoped, therefore, that the Victoria University, of which the Owens College is an affiliated institution, will recognise the work which goes on in the Manchester School of Technology as being work equivalent to that done by a University College, much in the same way as London University is recognising certain Professors in the London Polytechnic as doing work, whether in day or evening schools, equivalent to that done in King's College or in University College in Gower-street.

4362. Are there any relations existing at present between the Victoria University and the School of Tech-

nology?—I will just put before you the phraseology of a resolution passed only a few months ago as the result of a conference between the authorities of the Owens College and the authorities of the Municipal School of Technology. This is the resolution:—

"That the Committee of the Manchester Municipal School of Technology recognises the supreme importance of maintaining the Owens College in its special work as a University College, teaching the Arts and the Sciences in complete courses, at which ordinary and honours degrees may be taken.

"That the Council of the Owens College recognises the supreme importance of the Municipal School of Technology, being constituted and maintained as a School of Applied Arts and Science to the Manufacturing Industries and Commerce."

That is on the fifteenth page of the last Report of my Committee. A small standing Committee has been established with a view to maintaining the harmonious relations which should, in the interests of the public, exist between the Owens College and the Municipal School of Technology.

4363. Is it contemplated that the teaching in the School of Technology might be recognised as part of the teaching, or as a substitute for a portion of the teaching, in the University College?—That is hoped; that is in contemplation. I will put it, if you will allow me, in this way. The equipment of the Municipal School of Technology is of such a character that the post-graduate students of the Owens College could, with very great advantage to themselves, having regard to their previous three years' scientific training, gain much by going to the Municipal School of Technology for a year or two after they had completed the course at the College. Especially would this be the case in such industries as mechanical and electrical engineering, and in the great chemical industries of dyeing, printing and finishing.

4364. Does the Municipal School of Technology give anything in the nature of a diploma or certificate as the result of its teaching?—It has not hitherto done so: But this document, which, if you will allow me, I will put in, gives a report of a sub-committee on the organisation of the new Municipal School of Technology, and it contemplates the giving of a diploma by the Municipal School of Technology after a certain prescribed course of instruction. This document will explain that point. (*Document handed in.*)*

4365. At what age do the students generally enter this School of Technology?—The lower limit of age is fifteen years, upon a very simple entrance examination, consisting only of Mathematics and English. In that Report you will see that the Committee contemplate raising the entrance examination to the standard of the preliminary examination of the Victoria University. They recognise that in doing this they will probably deplete the number of students coming into the day department of the School very considerably indeed, and it may not be possible to exact the very highest standard of attainment upon this preliminary examination for the first two or three years.

4366. After that, I presume that the education is directly technical?—Yes. After the entrance examination the education becomes specialised; the student enters the department of Pure and Applied Chemistry, the department of Pure and Applied Physics, or the department of Engineering or of Textiles.

4367. Has your attention been called to the Royal College of Science in Dublin?—I know it, because we have not unfrequently sent students there from the evening classes of our schools.

4369. We may have a problem to solve somewhat similar to that which you have in Manchester, namely, the relations to be established between a College of Science or School of Technology—really, the difference is not very great in substance; it is more in words—and a teaching University or College. You have that question before you at present in Manchester?—That is so. The work of the Municipal School of Technology would be almost precisely that of the work of the Royal College of Science, either of Dublin or of London, with this advantage, so far as we are concerned, that our equipment is vastly in advance of that of either of those institutions.

4370. Up to the present you have not solved that question, but I gather that you are hopeful that it may receive a solution?—I think it will receive a solution.

4371. And the solution, as I understand you, would be something of this kind, that the degree should be the degree of B.Sc., conferred by the Victoria University under conditions such as you have described?—Yes.

4372. The teaching being in a Teaching College in Manchester, and the examination being conducted by the University in the manner you have described?—Yes.

4373. Then the suggestion that you think practicable is that for the purposes of the teaching leading up to that degree, the Municipal School of Technology might be utilised, and its teaching adopted?—I think it might be utilised in two ways: First, directly for students who enter the Municipal School of Technology at a suitable age, by means of a suitable entrance examination. It may be further utilised, and very advantageously, by students who have passed through the University College, wherever it might be—Liverpool, or Owens, or Leeds, it does not matter—who would spend a year or two of post-graduate work in scientific and technological research in the Municipal School of Technology. They would be able to do that because of the great efficiency of the equipment of the School. Then, as a further result of the opportunity which the School offers, it is hoped that evening students, already engaged in industrial pursuits, who have kept up their studies assiduously every year during the whole period of their apprenticeship, would then be enabled to spend, say, half of the working year, in research work, by means of the appliances the School possesses, in Chemistry, or Physics, or Engineering.

4374. The last portion of your evidence is very interesting and suggestive. In modern times, I understand that to have a School or a College thoroughly equipped for the purpose of technical and practical scientific instruction expensive apparatus and laboratories are required?—That is so.

4375. And, as I understand, your suggestion is this: that the appliances in a single institution of that kind—I am referring to apparatus and laboratories—might be utilised by more than one institution in the locality?—That is distinctly one of the objects the Committee have in view. The Committee feel, and its staff feel, that it is only in that way that the fullest use can be made of this most extensive equipment—I may tell the Commission that that equipment will certainly cost not less than £80,000—and the Committee feel that it is only in that way that it can be fully used. It cannot be fully used by merely elementary scientific students; it can be fully utilised only by students who have gone through a period of scientific study, such as they would get in a University College. It can be fully utilised also by men who have kept up their scientific knowledge, and are engaged in practice, and are interested in important industrial problems that they meet with in the course of their business, and who would be willing to spend three months or six months in some particular research. That is distinctly the object the Committee have in view. So that the institution is not an institution for Manchester only; it is much rather an institution for the area covered by the operations of the Owens College, or the whole of south-east Lancashire, and the greater part of Cheshire and North Derbyshire.

4376. Now, substituting Dublin for Manchester, and substituting our College of Science for the School of Technology, and adopting your suggestion, if we had connected with the School of Science in Dublin such a laboratory and such apparatus as you contemplate, that that great institution, with its very expensive apparatus and laboratory, might be utilised for the purpose of teaching Practical Science by various teaching Colleges or Universities in Dublin?—Most distinctly so. And I may put it for this stronger reason, that you can only in isolated cases provide this kind of instruction. My own distinct feeling is this, that so far as England is concerned, too much money is spent on small institutions, and that you want to segregate the teaching in suitable geographical positions, if I might so put it—in suitable areas, anyhow—and that these institutions should take only really well-prepared students—it does not matter whether they are day or evening, but they should be really well-prepared students, that is, really capable and efficient students. In that way you would do more to advance the industrial and commercial interests of the community than by spreading all over the district a number of small institutions. Small institutions are all right, so long as they are equipped for the service of evening students, but none of them are sufficient, either in point of means, resources, or equipment, to enable them to take charge effectively of day students of the character I have in mind.

* See page 279.

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Consequently you can have only in large centres really effective institutions. And you lead me to say by the tenour of your remarks that if you established in Dublin an institution such as is now established in Manchester, and will shortly be at work there, it will serve a large part of the district round about Dublin, and will minister more effectively than any other means I know of to the training of those who must be the managers and leaders of the industries, because it is they, rather than the artisans, as such, for whom we are most concerned.

4377. I do not suppose your attention has been specially called to the other portions of the country—to Belfast, or Galway, or Cork? Have you given any attention to those parts?—So far as Belfast is concerned, the gentleman who is now in charge of technical instruction in Belfast was my assistant up to twelve months ago.

4378. He is in connection with the new technical institution there?—Yes. Consequently, I know something about Belfast. Belfast strikes me as a case in point. You want to establish there an institution thoroughly well fitted and equipped for the whole of the North of Ireland.

4379. Would your idea be that it should be an off-shoot or development of the Queen's College there, or a separate institution affiliated with it?—I think it might be associated with it. I do not know what is contemplated in respect of the Belfast Queen's College, but what I feel is this, that just as you have, say in Berlin, a University where the highest class of scientific instruction is given, and also technical high schools of the very highest class, yet they work together. Post-graduate students pass from Berlin University in large numbers to Charlottenburg Technical High School, because of its good equipment.

4380. I do not know whether the attention of the managers of your School in Manchester has been directed to scientific education specially in relation to Agriculture?—No, sir; it has not.

4381. You would hardly expect that in Manchester?—No; we are not an agricultural centre.

4382. But the apparatus, I presume, necessary for establishing a school of agriculture would be very much less expensive and not nearly so elaborate; it might be more easily set up in, say, Galway, or some place of that kind, than the apparatus for a general technical school?—I think it would be far less expensive.

4383. However, as you have given no special attention to the point I will pass on?—I may just say that the Technical Instruction Committees of the Counties Palatine, Lancashire and Cheshire, have each of them agricultural schools, one at Preston in Lancashire, and the other at Holmeschapel in Cheshire.

4384. Does the Owens College devote any attention to what is now called higher commercial education of a University type—commercial as distinguished from technical?—It has no distinct commercial side. But a Chair of Chinese has recently been established with a view to training merchants or employes in merchants' offices in Manchester in Chinese, having regard to the considerable relations which Lancashire trade has with China.

4385. I understand, Mr. Reynolds, that you are prepared to give us some information in relation to schools established for Technical Education abroad. What we should value chiefly, I think, is an explanation of their relation to the Universities, how far they are independent of the Universities, and to what extent they are affiliated with or utilised by Universities?—Well, sir, I have been twice on the Continent, visiting chiefly the technical schools in Germany and in Switzerland, and I have found there—taking the Kingdom of Prussia, for example—that there are three or four technical high schools, one at Charlottenburg, another at Aachen, and another at Hanover, which give instruction on a University plane; that is to say, the instruction is of just as high a character from a scientific point of view as that taught in the Universities.

4386. When you use the expression that the instruction is on a University plane, I suppose you mean that it is of as high a scientific character in the special subjects, and not that it embraces every department of what is usually regarded as University Education?—No, sir; I mean simply that in the specialised subjects of Chemistry or Engineering—these institutions give just as high a class of scientific instruction as is found in the Universities of the State, but it is limited to that range of subjects.

4387. What does that eventuate in: a diploma, or a certificate, or a degree?—Hitherto it has simply been a diploma, but so far as the Technical High School at Charlottenburg is concerned, and the Technical High School at Hanover, the Emperor, by a recent decree, has empowered those institutions to give a degree in Engineering. The King of Wurtemburg has followed suit in reference to the Technical High School or Polytechnic at Stuttgart, and that is now empowered to grant degrees.

4388. These are degrees in Engineering and not in Science?—No, not in Science.

4389. It is what might be called a professional degree?—It amounts to this, that these men are trained for that profession; they are trained for important Government posts, or they are trained to become leaders or employers in the great German industries.

4390. Dr. STARKIE.—Is the work done in these schools recognised by the Universities, or is it entirely separate?—It is separate from the Universities, but so far as I know it is recognised.

4391. It is recognised?—So far as I know, but I cannot speak with certainty.

Mr Justice MADDEN.—Dr. Starkie means recognised as a portion of the education leading up to a University degree.

4392. Dr. STARKIE.—Mr. Reynolds says his Committee was anxious, in the case of Manchester, that the work done by the School of Technology there should be recognised in that sense by the University. What I was anxious to know, Mr. Reynolds, was whether you can quote any analogy from Germany for a proposal of that kind?—As I have said, each German University stands for itself. They do not seem to have in Germany what we have in England, two or three Colleges affiliated with a University. Take the University of Gottingen or the University of Berlin—each exists for itself and grants its own degrees.

4393. Mr. Justice MADDEN.—Take any one of the well-known German Universities; has it what we might call a side of practical and technical teaching? Does it recognise the subject at all, or does it not leave it to be dealt with by the technical high schools?—They leave it to be dealt with largely by the technical high schools. I know there is a conflict of opinion in Germany as to whether the scientific training of the Universities is not, on the whole, a better preparation, even for industrial life, than the teaching of the technical high schools.

4394. What is your own opinion on that subject?—Well, so far as my opinion is worth anything, it seems to me that the training of the technical high school, so far as and so long as it is based on sound scientific training, and directed specially to industrial work, ought to be, and I believe is, of more value. In any event, taking the number of students at Charlottenburg, there are 3,250 in the day department—they have no evening department—none of whom are under eighteen years of age. Many of them are post-graduate students who have been at the Universities, and 93 per cent. possess a certificate of nine years' attendance at a classical gymnasium or at a real gymnasium.

4395. You speak of post-graduate students. I suppose, apart from the question of whether a student could afford to spend so many years in study, or whether his parents could afford it, the ideal course of study would be to graduate at a University, and then afterwards to take up technical instruction at one of these Colleges. Is that course largely adopted in Germany?—I understand that there are a large number of such students, not only at Charlottenburg, but at schools like that at Darmstadt. As I happen to have had a son at Darmstadt Technical High School I know something at second-hand, so to speak, of the fact that there are a considerable number of men who have already passed through Universities, and who go up for research work at the technical high schools.

4396. For the class of students who might be able to afford such an extended course of study, does it occur to you that a course of study in a University College, combined with attendance upon a course of instruction in a technical school, might be advantageous?—I should like to put it in this way, that if a man's object in life is distinctly industrial, if his purpose in life is to enter into an industry, to take a responsible position in it, the technical high school ought to be able to give him just that kind of instruction which will help him to take satisfactorily and efficiently a responsible position in industrial life. If his object is otherwise, if his object is purely professional, so to speak, simply to

train himself to become a scientific man of the first quality, if I might so put it, then probably the University would be the better place for him. In such a case he would come under, perhaps, the most inspiring class of teachers, who simply pursued their science for whatever might come out of it in the way of addition to scientific truth.

4397. With regard to the students in these technical schools in Germany—you mentioned one or two—we are aware that they are numbered by thousands?—Yes.

4398. Now, as a rule, what is the ultimate destination of the great majority of those students?—Well, sir, Consul Rose, of Stuttgart, has recently issued a report upon the chemical teaching in Germany.* That report can be obtained, and it is a most valuable document. It deals with chemical training and instruction, and it gives this evidence—that there are in Germany 7,000 academically-trained chemists, that there are 4,250 of those chemists actually engaged in industrial employment in Germany, and that there are 1,000 Germans abroad who have had a similar academical training. So that that gives 5,250 men who have received the highest class of chemical training in technical high schools and in Universities who are now in effective industrial employment. That is what becomes of them.

4399. And what becomes of the great majority of your students—the students that you turn out in Manchester from your School of Technology?—Well, so far as the institution with which I am connected is concerned, all of them, at about eighteen years of age, find places in chemical works or engineering works, just as the case may be. That is their ultimate object.

4400. They seem to leave at the age at which students usually enter the older Universities; they seem to leave at about the age of eighteen?—Yes, for the obvious reason that, so long as English employers take the position that they do in respect of technical training and scientific training generally, there is no possibility of the bulk of them getting satisfactory employment at a later period of life. It is only in the industries where firms are willing to take youths at a later age that there is much chance of their remaining either at school or College after the age of eighteen.

4401. At what age do they usually graduate at the Victoria University?—The lower limit of age for admission is sixteen for the course of three years.

4402. That is for entrance?—Yes, for a course of three years, but, no doubt, the average age of admission would be between seventeen and eighteen.

4403. For how many years is the course at the School of Technology?—Three years.

4404. With reference to the Institutes of Technology in the United States, you are prepared to give us some information?—I think the great differentiation that one may make between the Institutes of Technology in the United States and the Technical High Schools of Germany and Switzerland is that the engineering side, both scientific and technical, is far more developed in the States than anywhere else of which I have any knowledge, and that the practical side of such study is given far more attention. So much is this the case that the attention of the authorities in Germany has been drawn to it. It is specially manifest in such institutions as the Boston Institute of Technology. There the School is devoted to the study of Science, especially in its application to Engineering, and they have something like 1,100 or 1,200 students whose average age on entrance is eighteen years and nine months, and who must, to enter the Institute, have passed a very severe examination in English and Mathematics, in Science, and in one or two foreign languages. I can furnish the Commission with a copy of my report upon conditions of Technical Education in the United States.†

4405. It would be very interesting?—From that report the Commission will see the large number of students who are in the Engineering Colleges of the States.

4406. That was a report presented by you to the School in Manchester?—Yes. The Committee sent me out, and I ultimately wrote a report and sent it to them. It will be seen from it that institutions like those at Cornell, Boston, and Worcester, and the Stevens Institute at Hoboken, and many others of that class, furnish a very high range of instruction in the application of Science to the engineering industry, and especially in the opportunity they give for research. That is a very important feature of American institutions.

4408. Now, are these institutions in any way utilised by the Universities? Take the Institute of Technology at Boston: is that in any way connected with Harvard University?—It has no direct connection with Harvard. Harvard is only a short distance away, but Harvard is also giving instruction in Science.

4409. Taking the question generally: what are the relations, if any, between these schools of technology in America and the Universities—Johns Hopkins, Harvard, for example?—The Johns Hopkins, Harvard, Yale, and so on, are institutions of a type approximating to the very highest class of English or Continental Universities.

4410. Certainly?—But I think the differentiation that I spoke of between the Technical High Schools and the German Universities prevails also in the States.

4411. In other words, they are independent institutions?—They are quite independent institutions.

4412. And up to the present time, at all events, the older Universities—the three that you mentioned, for instance—have not in any way utilised them or adopted their curriculum as a portion of the University course?—So far as I know, that is the case. The aim of the Institute of Technology or of the Technical High School, as the case may be, is directly industrial and practical, but based always—and to be of any use it must be so—upon sound scientific preparation and training.

4413. Dr. STARKIE.—What kind of degree does the Institute of Technology at Boston give, or does it give degrees?—It gives the degree of B.Sc.

4414. As in Germany?—As in Germany. The degree is much sought after. A student must not only pass certain examinations, but must prepare and submit a thesis upon a subject he has worked at during his graduate career. Their course is a four years' course at Boston, so that the students are twenty-two years of age at least before they can leave it, and there is no difficulty whatever in such students finding employment immediately.

4415. Mr. Justice MADDEN.—Is there any other matter connected with these foreign schools to which you wish to call our attention, more especially in their connection with University Education or University institutions?—I only wish to emphasise this point, that I believe that the success of the German chemical industry, for example, is almost entirely due to their schools; that the reason why, at any rate, the industry of producing the finer chemicals is past praying for in England is largely due to the extraordinary provision that has been made available in Germany for the training of scientific men, and that just as it is with the chemical industry, so it is very likely to be with the electrical engineering industry. They are making just the same careful provision for the training of leaders of industry in regard to electrical engineering as they have made in respect of the chemical industry.

4416. Has the development of Technical Education abroad, so far as your observation goes, tended towards the creation of new industries in Germany, or in other countries where such a development has taken place?—I think there is unquestionable evidence that it has.

4417. That is an important consideration, from our point of view, in a country where we rather lack existing industries?—The most striking illustration of that is the chemical industry. In the chemical industry in England we were paramount, say thirty years ago; but we are no longer paramount. Take a particular concern like the Anilin Soda Fabrik at Ludwigshafen, which employs more than one hundred highly-trained chemists, many of them mainly engaged in research with a view to the development of new industries, and they have succeeded in establishing new industries. For example, their success in finding a substitute for natural indigo is beyond all question now, and this report of which I have spoken—that by Consul Rose, at Stuttgart—shows the extent to which Germany has profited by her schools. He says, for example, that the fine chemical industries in Germany are now worth £15,000,000 a year.

4418. I have heard it said by some that there is no use in applying one's mind to higher Technical and Practical Scientific Education in Ireland—or, at any rate, very little use—because the industries do not exist. What would be your commentary on that suggestion?—Well, sir, I think they can be created. You have a Report of the highest value in that respect—in the Report of an Irish Committee that went out to Wurtemburg. You have an example there. Wurtem-

* Report on Chemical Instruction in Germany and the growth and present condition of the German Chemical Industries, by Dr. Frederick Rose, His Majesty's Consul at Stuttgart. Diplomatic and Consular Reports—Miscellaneous series, No. 561. Foreign Office, July, 1901.

† Report of a Visit to Technical Colleges, Institutions, Schools, Libraries, Museums, and Works in the United States and Canada, April and May, 1898. By J. H. Reynolds. Manchester: Blacklock & Co.

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burg was practically an Ireland fifty years ago, but it is now one of the most prosperous communities in the whole of Germany.

4419. Which Report do you refer to?—To the Recess Committee's Report.*

4420. The Irish Recess Committee's?—Yes, I refer to that Report. The movement in Wurtemburg was the result of the Great Exhibition in London in 1861, and, as I say, you had in Wurtemburg at that time an Ireland—a poor, agricultural country. Now it is a most prosperous agricultural country, and also a most prosperous manufacturing country, and that is due to the measures that were taken under the patronage of the King of Wurtemburg for the development of the small industries throughout the country. Take the cement industry. The cement industry is now a most important industry in Wurtemburg, and there are numerous others set forth, I remember, in this Report. What has been done in Wurtemburg—I say it with all due deference and with much ignorance of the existing state of affairs—might, I think, be done for Ireland. You, of course, are engaged in an inquiry which refers only to education at the very summit, but you never will reach the summit until you have laid the foundations broad and sound throughout the whole country. The success of German and Swiss education is entirely due to the sound and widespread system of Elementary Education, and, on top of that, Secondary Education. And much of our failure in England is due to the fact that we have no properly-organised system of Secondary Education. You can have no University Colleges, you can have no technical high schools, you can have no sound scientific training whatever, until Secondary Education is properly provided for. I mentioned the number of students at the Owens College—about 1,100. That is not satisfactory from the point of view of a large community like south-east Lancashire. There are 2,000,000 of people within ten miles of Manchester Exchange, and that body of people ought to supply far more than 1,100 students, because of that 1,100 students 400 are medicals, so that we are left with only 700 for the Arts and Sciences, and of those a good many are women. This cannot be satisfactory, and we can never get a proper supply of students until our system of Secondary Education on a sound basis is firmly established.

4421. You think that in considering the development of higher education—University education—with regard to the practical teaching of Science, we ought not to lose sight of the importance of laying of the foundation in Secondary and even in Primary Education?—It is absolutely necessary. You will never get the other until these are properly organised and thoroughly established.

4422. Most Rev. Dr. HEALY.—You made one very important and most interesting observation, Mr. Reynolds, and that was that the establishment of Technical Schools of the highest character would tend in Ireland, not only to foster, but to create, industries throughout the country?—Yes.

4423. That is a most important observation, and I was greatly interested in it. Now, our manufacturing industries are mostly in the North of Ireland at present. Do you think that one school in the North of Ireland, say at Belfast, would suffice for the whole of the North of Ireland?—I think that one school of the kind I have in contemplation would suffice, if means were taken to lay hold of the capable pupils, the capable youths in the North of Ireland, and, having given them a good, sound, general education, to have them brought there with a view to equipping them as foremen, managers, or directors of the industries of the North of Ireland.

4424. I suppose it would be desirable to have also another school in Dublin of the same character for the development of the industries of this part of the country?—It seems to me that in Dublin, in Belfast, in Cork, and possibly in Galway—I do not know anything about that, though—but in suitable centres, wherever there were such, to which you could bring, by means of Scholarships or Bursaries, capable, well-trained, but poor students, there should be such a school.

4425. That is for instruction in the industries that would be likely to be developed in those districts?—Yes, quite so.

4426. Of course the South and West of Ireland are mostly agricultural districts, and it would be more important there, I daresay, to have technical schools for the development of agricultural industries and rural industries?—What you want to do there is to follow the example of the Danish Government by establishing dairy schools and other measures for the improvement of dairy produce. Thirty-five years ago you could not sell an ounce of Danish butter in the English market. We now get annually £10,000,000 or £11,000,000 worth of Danish butter into the English markets, a very large portion of which goes to Manchester, one of the largest markets in England. But we might as well have Irish butter or Irish cheese, as have Danish, if the proper measures were taken.

4427. I suppose the high schools of technical science in Cork and Galway might be utilised in that direction for the development of agricultural industries and in other ways?—Quite so.

4428. And that would be most desirable. Then so far as manufacturing industries are concerned, I suppose we might be satisfied with one high school in Dublin?—I think one also in Belfast.

4429. I assume that; Belfast and Dublin, I mean?—Schools in Dublin and Belfast, I think, would probably satisfy the needs of Ireland under present educational conditions. But I think also that something might be done in the way of establishing trade schools. The difficulties in England are largely due to the close organisation which exists in England in connection with the various trades. I do not know whether or not the Commission are acquainted with Mr. Baker's report upon his recent visits to Austria, Poland, and Bohemia,† where he shows the advantage of the establishment of the so-called *Fachschulen*—special schools for the encouragement and development of small trades. That, I think, might be done in Ireland. I am well acquainted with one such trade school in New York, where there are something like 500 students, who go for a two-years' course—students of not less than eighteen years of age or over twenty-two years of age—who are taught brick-laying, plumbing, plastering, painting, electric wire fitting, and who at the end of the two years of such practical instruction in the principles or processes of those trades, go out tolerably expert—at any rate, expert enough to earn their livelihood.

4430. Have you anything of that kind in Manchester?—No; we could not establish it even if it were desirable; the trades' organisations would not have been in sympathy with it. Our position in Manchester is this: So far as the evening instruction is concerned, the School exists for tradesmen rather than to teach trades—that is to say, to lay hold of the young apprentice and give him a training such as he cannot, in the nature of things, get at his daily work, and I may say the School is very successful in that direction.

4431. Professor LORRAIN SMITH.—You draw a distinction between Technical Schools and Schools of Technology?—I do.

4432. I wish you would make that a little plainer?—So far as the Manchester School is concerned, we want it to be clearly understood that the School does not exist to teach the art of an industry so much as the science of it. A Technical School would concern itself much more with giving opportunities for skill in the school. That is not so much our object as to show and define clearly the scientific principles and their application to the development of the industry.

4433. Am I right in understanding that, according to your idea, the Technical School is a substitute for the old teaching given by a master to his apprentice?—Yes; a Technical School would be that, and so we are bound to make a great difference between the day school and the evening school. The evening school is attended chiefly by artisans. The evening school, to that extent, takes the place of the old position of the master towards his apprentice. The master nowadays no longer teaches the apprentice; the apprentice picks up his knowledge as best he can. In some shops he would be confined to a particular part of the trade; in others, in small places, the master's range of work is so limited that the apprentice can get only a very partial training in the business. Now, if he comes to the Technical School at night, he has the advantage not only of being instructed in the principles of Science applicable to his business, but he has also the advantage of obtaining some skill in the branches of it that he has no chance of acquiring in his daily life. Let me illustrate this by the very familiar illustration of plumbing. A plumbing student comes to the evening school and pays 10s. for his whole session's work. He comes four nights a week. One night he has Drawing; another night he has Mensuration

* Report of the Recess Committee on the Establishment of a Department of Agriculture and Industries for Ireland. With Appendices. Second Edition. Dublin: Browne & Nolan, 1896. (Appendix H.—Report on State Aid to Agriculture and Industry in Würtemburg, by M. G. Mulhall, p. 271.)

† Report on Technical and Commercial Education in East Prussia, Poland, Galicia, Silesia, and Bohemia. By James Baker F.R.G.S. Parliamentary Paper (Cd. 419), 1900.

in relation to plumbing work; another night is devoted to Physics and Mechanics as applied to plumbing; and the fourth night is given to actual work in plumbing. So he has every range of work applicable to his trade. What applies to plumbing applies also to house-painting, decorating, plastering, and any other of the domestic trades. But when you are dealing with the day student, you are not so much concerned to make him skilful as you are to give him a sound knowledge of the principles and the processes that he will be concerned with later on. He is not turned out a skilful person; he is turned out an intelligent person at the end of his work in the School. So that the day school is much more a School of Technology than is the evening school, which is rather technical than technological.

4434. Quite so; you deal with different classes of students in the two schools?—Yes.

4435. Have you different staffs?—In some measure we have different staffs.

4436. To what extent?—I will indicate it. The School is arranged in this way: We have a head of the physical department—a Professor, a man of satisfactory scientific attainments; we have a head of the chemical department, we have a head of the engineering department, and we have a head of the textile department, and those men are responsible for the organisation of the studies in their several departments. They give their chief time and attention to the day students. They supervise also, and take part, to a certain extent, in the evening work, but in the evening work we bring in specialists who are skilled in the various practical aspects of the trade or whatever it may be. So that the work of the School is largely supplemented in the evening by special teachers.

4437. Is not that very severe upon a Professor to have to teach technological students and technical students?—I am inclined to say that it is.

4438. You do not intend that to be a permanent arrangement, do you?—What we have to do is, not to exact an unreasonable amount of work, but to leave the teaching staff—what is absolutely essential if they are to be of any use for any length of time together—sufficient time for research.

4439. I am just coming to that. That is really why I asked the question. If you ask a man to teach both in the day and in the night classes, I do not see how he can possibly, even if he has the time, have the energy to undertake research?—Of course, it can only be done to a limited and reasonable extent. So long as he is able to take full supervision of the whole of his department we should not ask for an unreasonable amount of teaching. We are persuaded that such a man must have the fullest opportunities for his own education for research in his department.

4440. What would you regard—supposing you had the arrangement of an ideal institution—as a reasonable amount of teaching?—Well, what we are asking for in that report of the head of the department is thirty hours' presence in the institution.

4441. In the week?—In the week.

4442. That is five hours a day?—It does not mean five hours' teaching, but five hours' presence in the institution.

4443. And attention to what?—Attention to the organisation of his department, to see that the work is going on satisfactorily. Perhaps he would give, out of that time, two evenings in the week, say, of two hours each, to teaching. But his main duty would be to see that the work of his department was thoroughly well organised, and he himself would give a few of the more important lectures.

4444. Quite so; but does that go on all the year round?—That goes on for forty weeks.

4445. I do not see where the research would come in at all if he has to put in thirty hours a week?—Some portion of the thirty hours would be given to research.

4446. To come to another point. You say that the students who come to the Technological School should be, first, students who want directly the teaching of the courses in that school, and, secondly, University students who wish post-graduate work, and, I suppose, technological students who wish post-graduate work?—Yes.

4447. Post-graduate work, I suppose I may understand you to mean, is to be essentially research?—Yes.

4448. What type of research do you mean by that?—Well, take a student who has gone through the Engineering course. I will put in a document which shows the character of the equipment of the school.* We have a steam-engine laboratory; we have a hydraulic laboratory; we have a laboratory for other forms of heat-engines—gas, oil, and air engines; we have a laboratory for material testing; we have a laboratory for testing machine tools, and so on; and the student would have the means of pursuing lines of research in any one of these laboratories. Then, what applies to Mechanical Engineering applies to Electrical Engineering.

4449. And Chemistry?—And Chemistry.

4450. Professor DICKEY.—Have you a museum?—No, we have no museum, properly so called, but each department has its own exhibit of appliances and illustrations proper to the effective teaching of the subjects taught within it.

4451. Or a library?—Yes, we have a library.

4452. Professor LORRAIN SMITH.—To go on with this research question. I do not quite follow what is the nature of the research. I should very much like to have your opinion as to what you exactly intend by it. Is it research in the educational sense of training a man to research methods?—No; I think the research method ought to be the method which prevails throughout the whole of the man's career; less of lecture work and more of laboratory work, and more of laboratory work in the research spirit—that a man should come to the school as a post-graduate student with the research spirit developed in his mind.

4453. You speak of a from three to six months course of research. Surely you do not intend to do any valuable research work in six months?—No. Perhaps I did not make myself clear. When I spoke about a six months' research, I spoke of men actually engaged in industrial life. I spoke of men occupying leading positions as managers and so on, who had become interested in some particular engineering problem, if it is an engineering industry they are connected with. The School has got the equipment, and the man has got the scientific knowledge, and he has the practical training. Now, he says, "If I could pursue a research into the problem in which I am particularly interested, I am willing to give, or my employers will be willing for me to give, six months or more to that pursuit."

4454. What you have in view really is that to Professors and experts the equipment should be available?—Yes; and I mean this too: that if we get that type of man—and you do get him, abroad, to a certain extent, and you certainly get him in the States—you bring your teaching staff into direct practical touch—which is a most important thing—with the problems actually existing.

4455. I quite recognise the desirability of that, too. Now I wish to ask another question. You are familiar with the Institutes in Germany for the scientific solution of industrial problems; you are aware of their existence?—Yes.

4456. Those are Institutes which are supported by voluntary contributions from the manufacturers concerned?—Some of them may be.

4457. I think most of them are. Take an example. The brewers have united to support a large Institute entirely for research in regard to problems connected with brewing?—There is one in Berlin.

4458. Yes, near Berlin?—Yes.

4459. That is an Institute supported by the voluntary association of these heads of industry?—Yes.

4460. And an essential condition of the work there is absolute secrecy. I do not know; my information is somewhat indirect; I have not seen them myself; but possibly you can tell us about that?—It is news to me that the information obtained in these institutes is treated with absolute secrecy. That certainly would not be the policy in Manchester.

4461. Would it not be essential, in the organisation of such research, that secrecy should be maintained?—I hardly think so. It would not be our attitude. If there were any problems—chemical, or engineering, or Physical—that were of any importance to the industry of the country, we certainly would not undertake them with a view to keeping them secret from those concerned.

4462. Quite so, from your point of view; but from the point of view of the head of industry who is coming to you to make the investigation?—He would make the investigation under the direct superintendence of the Professor of the department.

4463. Which would destroy the secrecy?—Certainly it would, if secrecy was his object.

4464. I understand that in Germany they do recognise the ordinary trade secrecy?—I want to put this point. I visited, on behalf of my Committee, the Paris Exhibition, and I wrote a report† upon the educational exhibits there, and amongst the things I noted was the exhibit of scientific instruments from Germany. This exhibit was the joint exhibit of 700 firms in Germany. A joint catalogue was published, with a very

* See page 284.

† See page 287.

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remarkable preface, in which they continually insisted upon the great advantage the Technical High Schools and the scientific departments of the Universities had been to them as manufacturers, in the development of the industry of the manufacture of German scientific instruments. They show, in that Report, the close relation existing between the scientific teaching of the Universities and of the Technical High Schools and the industries concerned with the production of scientific appliances. These important industries, which are valued at £750,000 per annum, employ about 13,000 persons, mainly in the manufacture of fine instruments and glass ware, could not, it is admitted, have existed had it not been for the close alliance between the two bodies, so to speak, of scientifically trained men and of manufacturers. There is no secrecy there.

Professor LORRAIN SMITH.—I quite admit that; but there is a difficulty there which, I must say, I do not see the way to avoid.

4465. Mr. Justice MADDEN.—Where there is a voluntary association of persons in a particular trade they are masters of the position, and they can investigate for private purposes, just as the owner of one particular brewery might investigate. But where you have a State-supported institution, the result of the investigations and research carried on there must be for the public at large; there could not be secrecy?—That is so. As to voluntary associations for the purpose of research, that is a state of things which can only arise when English manufacturers become more sensible of its value. When they are, they may, perhaps, be ready to combine to support such an institution. Only the other day I was talking with a manufacturer who makes a special kind of gear. He uses a particular kind of steel made by a large firm in Yorkshire. This steel suddenly fell off in quality, and the works of this manufacturer were, in consequence, practically shut up for three or four weeks. He made inquiries as to how it was that the quality had fallen off, but the makers could not tell him; they only knew that the quality had fallen off. I made inquiry, and I asked, "Do they not employ a chemist?" The answer was, "No, they employed no chemist." They have now resumed making the particular quality of steel, but apparently it is just as much an accident as ever.

4466. Professor LORRAIN SMITH.—Do you know, as a fact, that they are secret—these voluntary associations?—I think that is extremely likely.

4467. Do you recognise no difficulty in that, in applying what the Chairman calls a State-endowed institution to the problems which would come before the members of such an association?—I do recognise a difficulty; but, on the other hand, I think there is a large remaining field for research in which there is no secrecy.

4468. I am quite at one with you there?—There is plenty of room for that kind of research.

4469. I am sure there is. Now, to come to another point. You have before you, in the Manchester School of Technology, the idea of giving instruction on a University plane, and you think the University might recognise the work of the School as of the same value as that in the Owens College. Is not that practically making it a University College?—Yes, to that extent.

4470. Quite so. Well now, does not competition come in very directly there?—There will be a certain amount of competition; but I think there is something to be said in favour of it. Our point of view is distinctly practical—it is distinctly that of aiding the industry. The point of view of the Owens College is largely general.

4471. Why do you say it is practical? Would you not rather have before you the educational idea?—So we have.

4472. Rather than the practical idea?—But *it is* the educational idea, always bearing in mind the uses to which it is to be put.

4473. That would inevitably be the idea of any technical department?—I do not think it would be so strongly the idea in a University College as it would be in an institution of the type I contemplate, and I point to the fact that abroad you have these institutions.

4474. And they are becoming Universities?—Yes; but they are becoming Universities only because it is recognised that the quality of their teaching is at least equal to that of the Colleges.

4475. Quite so; but would it not be undesirable to have this competition?—I do not know that.

4476. Would there not be an over-lapping?—I think not. The students who go into the Technical High School or the Institute of Technology are all of them students with industrial aims. The students who go into the University Colleges are not necessarily students with industrial aims.

4477. Still, they would all want education, as it were—mental evolution?—They all want training on sound lines, whatever their ultimate object may be.

4478. You say that you have £42,000 a year available as the resources of the Manchester Municipal School of Technology?—No, not at present.

4479. There is £18,000 grant, £12,000 from the 1*d.* rate, and then another 1*d.* rate?—If we can get it.

4480. That brings you £42,000?—Yes; if we can get it.

4481. Has the Owens College anything like that for Technical Science?—I do not think so.

4482. Then that means really that you are in a position to compete with the Owens College, with much greater resources?—We are in a position to supply the City of Manchester and the wide district around it, of which Manchester is simply the hub, so to speak, with effective technical training.

4483. I mean that the department of the Owens College could not possibly compete with you with its resources?—I do not think that the department of the Owens' College could compete with us in respect of the equipment of the school; but I rather look upon it in this way. I do not want to be in the position, and I should not like this Commission to regard us as being in the position, at all, of rivalling the Owens College. I should rather the two institutions were co-ordinated.

4484. Without co-ordination, the Owens College would be necessarily smothered, would it not?—There must be co-ordination. The Owens College is largely supported by voluntary contributions in one form or another—benefactions of various kinds—but it would be much better to regard the facilities of the Municipal Technical School, or School of Technology and the Owens College simply as facilities which belonged to the district.

4485. Exactly?—And to be co-ordinated, not as rival institutions in any shape or form.

4486. Since you regard as your constituency the managers and leaders of industry, you think it would do no harm to give the Technological School a University standing?—That is what I think.

4487. I quite agree with you. You say there is a Standing Committee. Has the Standing Committee been appointed?—A Standing Committee has been appointed, consisting of five representatives from each of the two institutions.

4488. What powers have that Committee, may I ask?—They have committed to them—but, perhaps, I had better read the resolution:—

> "That a small Standing Committee be formed of the two institutions, consisting of five representatives from each authority, to secure the benefits each is capable of giving to the city of Manchester."

4489. What powers has this Committee, do you know?—Only powers of recommendation to the College on the one hand, and to the Municipal Council of the city of Manchester on the other. I may say that the question is complicated, because, you see, the Owens College, as such, cannot do much in reference to the policy of the University, except so far as it does it in association with Liverpool or with Leeds.

4490. Liverpool is contemplating leaving, is it not?—If it leaves, of course Leeds must go too. You can very well see that it is not so easy to come to terms, because Manchester could make satisfactory arrangements themselves, but they have Liverpool on the one hand, and Leeds on the other. Leeds is chiefly a School of Technology.

4491. I would like to have your opinion as to how the co-ordination should be carried out?—I think it can be carried out by the Technical Instruction Committee giving the utmost facilities to the students of the Owens College.

4492. I mean the co-ordination of the two institutions, making them one; really that is what it comes to. How would that be done?—As to making them actually one indivisible body, so to speak, I do not know at the moment how that could be carried out, but I can easily see how an arrangement could be made whereby the courses at the Municipal School of Technology should be recognised as being courses which would lead to a degree of the University.

4493. Exactly; and the courses at the Owens College being recognised for the Technological School?—Quite so, and as I said at the beginning, I think the most useful work the School of Technology could do would be to enable the men who have gone through a complete

scientific course at the College to spend a year or two of post-graduate work with the equipment of the Municipal School of Technology.

4494. Is there any reason to duplicate the courses like that of Pure Chemistry, say, both in the Owens College and in the Technological School?—What we are bound to do is this: We cannot divorce the technical side from the scientific side; we ought not to do it.

4495. You would not be doing that if you had co-ordination?—I do not know that you would, but it largely becomes a matter of business. Here we have at the School of Technology a large number of evening students. No doubt we shall take measures to reduce that number—I mean to reduce it in this sense, that we will take only students with a certain amount of preparation in the evening classes. A place like the Owens College is not so convenient for evening teaching as the School of Technology. Yet we must give, even to those students the very best training we can give them, if the training is not to become merely empirical. The situation of the Owens College is not so convenient.

4496. The situation?—Yes; that is very important. You have to look upon Manchester as a centre, upon which several lines of railway converge, and which has great districts devoted to manufactures all round about it, from which students come to the School, you must have a situation reasonably convenient to the termini. And, in any case, if the ideas of those who have these matters at heart are developed, and are as successful as we hope, it will take both institutions to provide the necessary facilities for teaching, both day and evening.

4497. But what I contemplate is this: You have an eminent Professor of Chemistry in the School of Technology and an equally eminent Professor in the Owens College. One has a substantial share of this £42,000 a year, and the other, if he is treated like Professors in most Colleges with which I am acquainted, is struggling to make both ends meet. If they are to compete, one must be a failure as compared with the other?—There is unquestionably that point.

4498. Whereas, if co-ordination is carried out, that need not happen?—I am for co-ordination, and have been for it all along, without any sense of rivalry. My idea is this: Here is a great city like Manchester, which has not half the facilities for Technical Education of a second-rate German town, although its industries are enormously greater than those of any German city, and it is time that those facilities were provided. The Corporation have shown their willingness to provide them. Whether they should have done it by working through the Owens College is a matter into which I cannot enter. But in any case they have done it, and the idea should be the co-ordination of that work, whether of the College or of the Corporation through its School, so as to make it, as they say in this resolution, "conduce to the best educational interests of the city." I do not care how it is brought about.

4499. This Commission, in making recommendations, are very anxious to get the experience of Manchester on this particular co-ordination problem, because in providing facilities in industrial centres for teaching industrial work, it is obviously very desirable that they should not be arranged so as to neutralise each other?—Well, you can take it from me, as representing the Committee, that it is the most earnest desire of my Committee to bring about a co-ordination which will increase the efficiency and develop the usefulness generally of both the College and the School, in the interests of the citizens at large.

4500. You have not gone the length of having a governing body?—No; except the Committee.

4501. Professor DICKEY.—If you were beginning entirely again, would you start with the co-ordination principle?—If I were beginning entirely again, I would start with one local authority for all education in the city and district.

4502. Professor LORRAIN SMITH.—There is one question more I desire to ask. What about the day fees at the School of Technology—are they the same as those at the Owens College?—No; our fees are fifteen guineas; the fees at the Owens College are, I should think, from twenty-five to thirty guineas.

4503. How is competition possible on those lines?—Well, you must remember that the College has, at present, the advantage of giving degrees, which is an enormous advantage.

4504. But you would not regard that difference as satisfactory?—I should make no difference in the fees.

4505. You have a large staff for the Municipal Technical School?—Yes.

4506. As a matter of interest in regard to this subject, might I ask what is the average salary given, say, to the Professors?—The salary of the Professor of Engineering is £700 a year; that of the Professor of Chemistry it £500; that of the Professor of Physics, £500; and there are subordinates, the salaries of whom range down to £400, £300, and £200.

4507. Dr. STARKIE.—You know that University Education alone falls within our province?—Yes.

4508. And consequently I find some difficulty in putting any questions to you upon the relation of the School of Technology in Manchester to the School Board and the Grammar School. But you made one remark which, perhaps, would justify me in asking you to develop what you said, viz., that it was impossible for us to reach the summit, or to achieve University Education, unless the foundations are laid properly. For that reason I should be glad if you would develop your views on the existing relations and those that would be desirable between the Municipal School of Technology and the School Board and the Grammar School?—Well, my Committee, some four or five years ago, came to an understanding with the Manchester School Board in reference to its range of teaching, and by reason of that understanding, which is set forth in a copy of a report which I have not with me here, but which I can hand in—a concordat was drawn up between the School Board and the Technical Instruction Committee.

4509. I should be very glad if you would put that document in, because it is a very important problem in this country?—I will put it in.* The School Board agreed that so far as the evening teaching was concerned, the advanced teaching and the honours teaching in Science and in Arts should be done exclusively by the Technical Instruction Committee in its School of Technology and in the Municipal School of Art. It was agreed further that the School which hitherto had been carried on by the Technical School should no longer be carried on, but that the Higher Grade Schools, and especially the Central Higher Grade School in the city should act—or, at any rate, that the teaching should be so arranged that they might act—as a feeder to the day classes of the Technical School. And that arrangement has been carried out from that time so far as has been found possible.

4510. Do the students attending the Higher Grade Schools then come to the Technological School for a portion of their curriculum?—The students of the Central Higher Grade School are mainly boys and girls who have passed the sixth standard.

4511. Over fourteen years of age, I presume?—They would be about fourteen years of age. Some of them would be only thirteen, because they can pass at twelve. But they would be from thirteen to fourteen years of age, and they go to the Central Higher Grade School for two years, and, in some extreme instances, perhaps, for three years, the intention being that they should receive a course of instruction which would fit them to enter the Municipal Technical School.

4512. At fifteen years of age?—At fifteen or sixteen, as the case might be. But only a comparatively small number find their way to the School, and the number that do come come mainly by means of Scholarships. My Committee gave to the School Board twenty-five Scholarships, of £9, £12, and £15. The recipients were to hold these Scholarships at the Central Higher Grade School for two years. In these cases they would all have passed the seventh standard. At the end of the second year they would pass from the Central Higher Grade School for a year at the Municipal School of Technology. I cannot say that that scheme is in very effective operation, because, as a matter of fact, most of those who have spent their two years at the Central Higher Grade School take up active life, and go out and enter the industries.

4513. Would there be no possibility of attracting those students to the School in the evening?—Oh, yes; a large number of them come, and we have courses for that purpose; we grant Exhibitions for them.

4514. And have you found that scheme successful?—Fairly successful, yes. In Manchester the principle has been adopted of putting an Evening Continuation School in connection with every Day School, whether it is Board or voluntary.

4515. Are they well attended?—They are very well attended; there are about 25,000 students.

4516. Do they give a scientific instruction in those Continuation Schools, suitable for candidates for the Technological Institute?—Yes, they do. These schools are spread all over the city, and Elementary Science and Elementary Commercial Knowledge is taught in each school. There are schools also for women, called

* See page 289.

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Women's Institutes, and so on, and we grant small Scholarships to the pupils in these Continuation Schools. Last year I think there were sixty-three small Scholarships, which, on the nomination of the head masters of these schools, would bring into the evening classes of the Municipal Technical School the more capable students.

4517. Can they take the full course of your Technical School by attending the evening instruction?—Yes.

4518. They are in exactly the same position, are they, as those that attended the day school classes?—They are not nearly so well prepared as those who attend in the day time. They are boys who, as they leave the day school, pass, mainly as the result of the influence of the head master, into the evening schools, and they attend the evening schools for one or two years, and we give small Scholarships which will bring the more select of them—I mean those who are the best prepared—into the evening classes of the Municipal Technical School, and they enter upon any course that is found suitable for the particular industry in which they are engaged.

4519. For how long do they continue to attend the Technical School?—That would be a difficult question to answer.

4520. What I wish to arrive at is this: Are many of them induced to pursue their studies for such a time that they really become scientific men?—Oh, no; I should not say that. Only a comparative few would ever deserve such a title. The most that you can do with them is to give them such elementary scientific instruction applicable to their particular trade or business as they are able to take, having regard to their previous preparation. You might say that they would attend for two or three years in the evening classes. But there is a constant flux going on in these cases; some students attend only for a year or so, and some attend for two or three or more years.

4521. What is the relation between the Grammar School and the Board Schools?—The Manchester Grammar School is the only Secondary School in Manchester, for boys, of a public character, and one-half of its scholars are foundation scholars, drawn from the Elementary Schools of the city and the district around the city.

4522. At what age would they leave the Primary Schools?—I should think not earlier than twelve.

4523. And I suppose that in almost every case they are students who get Scholarships or Bursaries?—They are on the foundation.

4524. They are on the foundation?—Yes; which gives them free tuition.

4525. Until what age do they remain at the Grammar School?—The Grammar School has pupils up to the age of eighteen years, because it prepares the more capable of its pupils for the Owens College, or for the older Universities.

4526. Then consequently, in Manchester, it is possible for a boy attending a Primary School to rise by easy degrees, and, helped by public endowments, to a University Education?—Yes; the so-called ladder is complete in Manchester. My Committee offer Scholarships to the Grammar School. They offer, first, Scholarships which bring the boys into the Higher Grade Schools or the Schools of Science of the Manchester School Board; they offer Scholarships which will take boys from the Higher Grade Schools or from the Elementary Schools of the city to the Grammar School; they offer Scholarships which will take boys from the Grammar School or Higher Grade School to the Technical School or to the Owens College. There are four Scholarships of £60 a year, bringing boys to the Owens College; there are six of £25 each, which take boys to the Grammar School; there are fifteen of £30, which take boys to the Municipal School of Technology; and five of £30, which take boys to the School of Art.

4527. All given by your Committee?—Yes.

4528. What interest does your Committee take in the Grammar School that it should offer Scholarships to boys entering the Grammar School?—Simply the interest it takes generally in the subject of education in the city.

4529. Do you induce the scholars attending the Grammar School to attend any of the scientific lectures at the School of Technology?—No.

4530. Or is their scientific education entirely provided for?—The scientific education is provided for. The School has a classical side, a modern side, and a science side.

4531. Consequently, you have nothing to gain directly from the scholars that you induce to go to the Grammar School?—No.

4532. You have developed fully, I think, the present co-ordination of the various educational authorities in Manchester; but still, you think that the organisation of education in that locality leaves much to be desired?—I certainly think that; and I think it will never be satisfactory until there is one local authority dealing with all forms of education—at any rate, up to the University.

4533. Up to the University; I quite agree with you?—And the moment that takes place I think it will lead to a much more efficient organisation, not only in relation to the Grammar School and the other educational institutions in the city, but also in reference to the curriculum of the Higher Grade Schools. The Higher Grade Schools' curriculum is a course devised by the Board of Education, or rather by the Science and Art Department, and, in my view, it is a very unsatisfactory curriculum. It tends to a certain rivalry between the teaching, say, of Technical Schools and that of the Schools of Science. I will explain what I mean. The first year of instruction at a School of Science is partly literary and partly mathematical and scientific. The second year is specialised——

4534. You are speaking now of the Higher Grade Schools?—Yes, of the Higher Grade Schools. The second year is specialised for mechanical subjects, or for chemical subjects, and you will get, in the second year, such subjects as Mechanical Drawing, or Applied Mechanics or Steam, as the case may be, which are peculiarly the subjects which would be taken up in a Technical School. Now, I think that if we have one authority, we could alter that state of things, and we could arrange the instruction of these boys up to fourteen or fifteen years of age quite satisfactorily, without specialisation of any kind.

4535. Until what age do boys remain in the Higher Grade Schools—sixteen years?—Some are as old as sixteen or seventeen.

4536. What would be the character of the single local authority that you would propose?—Well, I should make it largely municipal, with such co-optive members as might be found desirable to give it the benefit of expert experience, whether it was educational or industrial, and, of course, it would include representation which would serve the interests of both sexes. The municipality would have to find the money; and the municipality ought to have the ultimate control.

4537. The municipality would not have to find all the money, because I suppose the Board of Education, at any rate in the case of the Board Schools, would make very large grants?—No doubt they would; but, you know, that so far as matters are arranged now, the locality appoints its own authority at present for the Board Schools—an elected body pure and simple; whereas I would support a local authority which was not only a body nominated by the City Council, but a body which would include experts both of educational and of industrial experience, and of both sexes.

4538. Professor DICKEY.—You said you had some knowledge of the Technical School that is being established at Belfast—through the headmaster, who used to be one of your assistants?—Yes.

4539. Is that School to be of the same type as the School of Technology which you have in Manchester?—I should judge, from the plans I have seen, and from what I know of the mind of the Director of Technical Instruction in Belfast, that it would largely follow the example of Manchester. His experience of Manchester is very considerable; he knows exactly the ideals and aims which have animated the officials and the Committee in Manchester; and I think he would endeavour to induce his Committee to follow in their steps as far as possible.

4540. So that it would be a School of Technology as well as a Technical School?—I think, generally, it would emulate what we have in Manchester.

4541. Now that they are beginning the work there practically from the beginning, do you not think it should be co-ordinated from the beginning with Queen's College, Belfast?—I think it is desirable that it should come into the closest possible relation.

4542. Have you any suggestions to make with regard to that co-ordination?—I think the authorities of the Queen's College and the municipal authorities—of course, I speak in profound ignorance of the Queen's College and its work—ought to come into the closest touch in the matter.

4543. Supposing there was a University established in Belfast, it should recognise the teaching given in the School of Technology as qualifying for some degree in Science?—I certainly think so.

4544. I see you have Architecture taught as one of the subjects, in Manchester?—Yes.

4545. Have you a great demand for Architecture?—I would not say there was a great demand, but there are a large number of articled pupils, and assistants in architects' offices and engineers who attend these classes in the School of Art in Manchester—in the Municipal School of Technology.

4546. And it is proposed that there should be some degree given for Architecture?—The Victoria University already grants degrees in Architecture.

4547. The Victoria University?—The Victoria University does; but the only efficient teaching in connection with the Victoria University in Architecture is given in Liverpool under Professor Simpson.

4548. Mr. Justice MADDEN.—In what College?—In University College, Liverpool.

4549. Professor DICKEY.—Coming to the Victoria University, it is a University consisting of a federation of three Colleges?—Yes.

4550. Liverpool, Leeds, and Manchester?—Yes.

4551. Liverpool College is purely a College in the ordinary sense of the term—that is to say, literary, and scientific, with a Faculty of Law and a Faculty of Medicine?—Yes.

4552. There are all those faculties in it?—Yes; and it has a technological side.

4553. And that technological side is in the College?—Yes.

4554. It is not a school separate from the College, as your school is separate from the Owens College?—No. It has a strong Engineering side. I do not want to make comparisons, but it has a strong Engineering side. The Owens College has a strong Engineering side, also.

4555. Wherein does the Liverpool College differ from the Owens College, in the matter of Technology?—Liverpool College, from the very force of circumstances, has taken, I was going to say, a more prominent position, in relation to technical teaching, at any rate in the evening, than the Owens College. I do not wish to be misunderstood, because I come from Manchester, but I want to make my position perfectly clear in this way. Liverpool has only recently risen to its responsibilities in relation to scientific and technical training. Now, probably, if there had been as active institutions in Liverpool as in Manchester in relation to technical matters, the situation in Liverpool would have been much the same as that in Manchester. But it has not been the case in Liverpool, so that the University College in Liverpool has had the opportunity, in a sense, of developing—this is where the activity in Liverpool is different from that of Manchester—its evening technological teaching to a greater extent than has been necessary in Manchester, in view of the fact that we have had a Technical School so active for the last seventeen or eighteen years.

4556. In fact, Manchester has been doing a work which Liverpool also is setting about doing?—And now Liverpool has established a municipal Technical School.

4557. Liverpool has?—Liverpool has built one.

4558. That is under the recent Act?—Yes, under the recent Act. It was opened a few weeks ago by the Duke of Devonshire.

4559. So that Belfast comes nearer to Liverpool in type than it does to Manchester?—I should say so; though I do not know the extent to which the Queen's College has ever offered technical instruction to the citizens of Belfast.

4560. It has never done that?—Liverpool has done it; and to that extent the Technical Instruction Committee have not had to do for Liverpool what the Technical Instruction Committee have had to do for Manchester.

4561. Is it proposed that the Technical School in Liverpool should be co-ordinated with the College at Liverpool?—It is in very close relation indeed.

4562. Is it of the same type as that of Manchester?—No; it is not so highly developed.

4563. Mr. Justice MADDEN.—It is more a Technical School?—It is more a Technical School.

4564. There is no need for Technology there in the same sense as in Manchester?—I do not think there is.

4565. Professor DICKEY.—That would be a very good parallel for Belfast?—I think it would be.

4566. There has been a good deal of discussion in Manchester and Liverpool about the College in Leeds. That is an almost completely equipped College, too; it has Faculties of Science, Law, Engineering, and Medicine. But it has a large Technological department?—That is its most prominent feature. Leeds is much more a Technological College than it is an Arts or Science College, or a College for Medicine—very much more. In fact, it owes its development almost entirely to the Cloth-workers Company of London, who have found the money to establish its teaching in Industrial Chemistry, as applied to the textile trades.

4567. That is the most modern type of College in England, with the exception, perhaps, of Birmingham?—It is the best example, perhaps, in England of the development of the technical side of a University College, and that mainly on the textile side, for the manufacturers of the textile goods of Yorkshire, and their dyeing and finishing. On that side it is, perhaps, the most advanced institution in the country.

4568. That is to suit the local industries?—Yes. It is that that gives it its strength.

4569. Here are three Colleges of very different types in the one University. There has been considerable discussion recently—has there not—about dissolving the Victoria University and dividing it into two or three separate Universities? The Liverpool people have asked for a University for themselves?—Ever since the successful development, under Mr. Chamberlain, of the University of Birmingham, the feeling has gone forth that every great centre of population might usefully have its own degree-giving College. How far that is a sound principle, abler men than I must discuss. But there is the fact, and there seems to be little doubt that the public spirit of Liverpool will, as in the case of Birmingham, succeed in establishing in Liverpool an independent College, with the power of granting degrees. If that takes place Manchester will certainly seek for the same thing.

4570. The Owens College will be created a University?—Yes.

4571. And what about Leeds?—Leeds will have to take care of itself.

4572. Is that separation of the University into two or three different Universities not due largely to the differences in type between the Colleges?—Each locality develops its own peculiar individuality, and I think that that in itself is sufficient to account for the desire that has lately been manifested for independent Colleges. People point to Scotland, and say: "There, you have the Universities of St. Andrew's, Edinburgh, Glasgow, Aberdeen, and so on, in a comparatively small country," and those are fairly successful types of independent Colleges granting degrees. I think there is something to be said for the public spirit of those concerned under such circumstances, each working independently in this way.

4573. Do you know anything of Belfast, its manufactures, and industries?—I know them, I think, generally, and I would like to say this on the point. Some years ago I went to Belfast, at the instance of public men there, and spoke upon the question. I think Belfast is a city which is peculiarly favourably situated for most successful technological training and teaching. It has a great variety of industries, and I do not know a city where more good could be done in this way than in a city like Belfast.

4574. Looking at the development of Universities in England, do you not think that Belfast would require practically a University for itself if its industries are to be nursed, so far as they can be nursed by a University?—I think that in a city so enterprising as Belfast, and so industrially successfully, as it appears to be, it would probably be a good thing to establish a degree-giving body.

4575. It would be a University of a special type?—Certainly.

4576. You said that Belfast was very favourably situated for technological instruction. Would you develop that just for a moment?—You have great shipbuilding industries there; you have great textile machine industries, like Coombe, Barber, & Coombe; you have the linen trade; you have the brewing trade; you have, or had, a most successful printing industry there—I mean Marcus Ward's. I mention that particularly, because of its artistic side. I do not know how far, but I think, that, under favourable circumstances and influences, that might have been much more developed. I say that because I had a striking instance, which I mention in my report on Germany,* of what happens when you bring intelligence with knowledge to bear on an industry like the printing industry. That is the case of some works at Nuremburg, employing about 800 hands. There you have it in a remote part of Bavaria, and, because of the enterprise of those in charge of this industry, they do an enormous trade with

* Report of the Deputation appointed to visit Technical Schools, Institutions, and Museums in Germany and Austria, July and August, 1897. J. H. Reynolds. Manchester: Blacklock & Co.

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England and America. I went through the whole of the magnificently-equipped works, and I did not see a single book in German type in the whole of the building. Every page was in English, and intended for the English or American market. What I feel is, that under proper auspices, and with the facilities which this particular firm had—because in Nuremburg there are magnificent Art Schools—in Belfast, you could develop a like industry, if only you had a proper Art training available for those who have charge of the business. So that in Belfast you have a great variety of industries—some of them exporting industries, some of them local industries, and domestic in their character; but I know of no city where there is such a variety of industries and employments, and where, therefore, a Technical School, under right management, would have a chance of doing a very valuable work in developing those industries, and in creating new ones—because new industries can be created if only the facilities are offered. Close to Manchester, where you would think that it would be least likely, there has grown up within the last ten years one of the most important tile-making businesses in England. In this business, at Clifton, near Manchester, the most beautiful tiles that can be produced are made. It is an entirely new industry, and is the result of training a man in Chemistry in one of the Higher Grade Schools in our city. It shows what can be done once the effort is made under favourable circumstances.

4577. Have you any knowledge of Ulster, outside of Belfast?—No.

4578. Are you aware that there is a considerable amount of minerals, such as iron ore in the North of Ireland, and coal, too?—I am not aware.

4579. Mr. Justice MADDEN.—The special value of your very interesting evidence is, that it is founded upon practical experience and, as that experience was largely acquired in Manchester, it was inevitable that a great deal of your evidence had relation to the special circumstances of Manchester, and to the educational system there, which is somewhat different from ours. Don't understand me as undervaluing that portion of your evidence, because we often learn by the experience of others, but I should be glad to know whether you are prepared to deduce the following general principles from your evidence:—First of all, I think your evidence tends to this general proposition, having regard to the very considerable expense which must necessarily be incurred for the apparatus to equip a Technological School which, you have stated, in the case of Manchester, was something like £80,000——?—That is for fitting alone.

4580. For equipment?—For equipment alone.

4581. So I understand. That circumstance would point to the desirability of utilising a single well-equipped Technological Institution for the purpose of a number of teaching institutions or Colleges?—You may take it that that is my view.

4582. And you see no insuperable practical difficulties in the way, either by utilising or by co-ordination on the part of these teaching Colleges or Universities, of taking advantage of the special teaching or equipment that would be thus provided?—I see none.

4583. That is a general proposition that can be deduced from your evidence. There is another proposition which you have laid down, with great clearness, and illustrated from your experience in Manchester. It is this: Whatever institutions are started for a country or town in connection with Technical Education, should be so arranged as to lead up, step by step, to the highest type—the University type of teaching?—Yes.

4584. With the result that you gradually bring up to the highest grade, and introduce to University Education the promising pupils from the lower?—That is so. I would like to put in this document, if the Commission will allow me. There is in England a Technical Instruction Association, which meets annually. At the annual meeting, in April last, with the view of comparing the number of students they had in Technological Institutions, whether Technical Schools or Colleges, for not more than twenty hours a week, and who are not less than fifteen years of age, with a view to inquiring to what extent this training was offered, and how many were attending a course of training of this kind, I moved for a return, and I would like to put it in.* It gives an opportunity of showing how we stand in relation to foreign institutions. The total number studying in these institutions given here, taking a variety of subjects, such as Brewing, Building, Engineering, Mining, Chemical, Electrical, Textile Industries, and so on—these are students who enter at not less than fifteen years of age—the total number was 2,080 in the first year; 1,125 in the second year; 555 in the third year, and only 113 attended more than three years. There were some 3,800 students in all departments in all the Technical Schools and Colleges, so far as the returns have been given, and they are pretty complete for the whole of England; and you have as many as 3,250 students in one German School at Charlottenburg, where they enter at eighteen years of age, and present a certificate of at least a nine years' course in a Gymnasium. This report is a very important document, as showing the poor extent to which we in the United Kingdom support technical training, compared with the extent to which it is supported in German schools.

4585. Perhaps I may also point out, finally, another general proposition to be deduced from your evidence:—the circumstance that a country is deficient in industrial pursuits, so far from being a reason why it should not apply itself to the development of technical instruction, tends in the opposite direction?—Entirely so. I believe you can, under suitable auspices and conditions, create the industries which do not at present exist. I put in these sketch block plans of the new school in Manchester. In addition to that the Committee are building a school for Bleaching, and Dyeing, and Finishing, and also for Paper-making, by the side of that particular building.

The Witness withdrew.

ARTHUR HILL, ESQ., B.E., M.R.I.A., F.R.I.B.A., Lecturer on Architecture, Queen's College, Cork, examined.

Arthur Hill, Esq., B.E., M.R.I.A., F.R.I.B.A.

4586. Mr. Justice MADDEN.—Mr. Hill, you are Lecturer in Architecture in the Queen's College, Cork?—Yes.

4587. You are a member of the Royal Irish Academy and some other learned bodies?—Yes, of the Royal Institute of British Architects, and a life student of the Royal Academy, of London.

4587A. What place does the study of Architecture occupy in the Queen's College, Cork?—The Lectureship was created by the Council, without any powers of appropriation of salary or making of any other arrangements. I lectured for two years, in 1894 and 1895. The third year, the number of *bona fide* students presenting themselves was very small—only two or three at most—and it was not worth while carrying on the lectures for these students, because they got no credit for it in their examinations. One could not ask students to give up their work in the Engineering course, where their responsibilities lay, to study a subject for which they could get no credit.

4588. These were Engineering students as a rule?—As a rule, and one or two who attended the course were men who were studying Architecture—architects' assistants.

4589. The study of Architecture forms no part of the curriculum?—Except on paper.

4590. How do you mean on paper?—It is included in the prospectus of the College.

4591. Are students examined in Architecture?—There is an examination in Architecture, which forms part of the first or second years' course in Engineering, and that is carried out by the Professor of Engineering.

4592. You are prepared to offer us some suggestions as to the position which you think should be occupied by the study of Architecture, and the profession in Architecture, in a University system?—Many years ago, when I took my degree in the Queen's College, Cork, and then went to London, I found that the young man studying Architecture had absolutely no systematic course of study. I wrote a paper at the time, which was read at a conference of Architects held in London in 1874. It was called "College Training for Architects." My proposal was that the architect should be put on much the same footing as the engineer, in the University. There should be a Professor of Architecture in every University where there is a School of Engineer-

* See page 274.

ing. The two professions should run together. It would certainly improve our engineers. Some higher idea of a sense of beauty would be no harm to them, and the association of the artistic temperament of the architect with the practical work of the engineer would be a benefit to architects; and there is no reason why the two professions could not be worked together in that way. The condition of affairs is this. In 1887, the Royal Institute of British Architects, as representing the profession, considered that an educational standard was necessary for the profession. They got a new charter at that time, and the charter conferred the power of holding examinations. In 1887 they then decided that every Associate should pass a series of examinations extending over three years. Out of the Associates the Fellows are elected, so that at the present moment, so far as membership of the Royal Institute of British Architects is concerned, the gate is closed. Nobody can become a member of the society who has not passed the three consecutive examinations. The Institute has decided what they think an architect should know. There have been some criticisms. I got a letter this morning from Professor Simpson, of Liverpool, saying that, in his opinion, the education should have been provided first, while entirely agreeing with the principle that education should precede examination. I don't think that is a fair view to take, because if the Institute had not decided what an architect should know, we would be now as we were thirty years ago. I think the complaint is that the State has not accepted what the profession has declared to be necessary, and provided the necessary education, instead of leaving it entirely to voluntary effort.

4593. Where are the examinations held?—In London, or in any part of the provinces where students present themselves. The Architectural Association of London is a junior body which exists almost for the purpose of mutual aid in education, and when the Institute started these examinations the Association commenced classes. These classes have been carried on altogether out of their own pocket. They are principally night classes, but this year they have launched out a little further, and have established day classes. That is the curriculum of the Association, so that the Association voluntarily tries to do what it can to furnish young men with a system of education. There are in London, of course, other classes designed for architects. There is a course of Architecture in University College, but it consists simply in the history of Architecture, and a course in Building Construction, which are very well so far as they go, but incomplete. There are courses in King's College; but I think I might sum up the general professional feeling towards these classes as this: that they are inadequate. Recently, a School of Architecture has been developed in the Liverpool University, I believe, by private effort altogether.

4594. Is that the only University College in the United Kingdom that confers a degree in Architecture?—That is the only University College where they have commenced to give this degree for the first time.

4595. That is the degree of Victoria University of which the Liverpool University College forms a branch?—Yes; it is only in Liverpool that this degree can be got, because that is the only one of the three Colleges that has got an Architectural School.

4596. But no University degree is conferred in Architecture except through the University College of Liverpool?—Yes. Here is a prospectus of the Liverpool College (*handing it in.*)*

4597. The London University confers no degree in Architecture. Is that so?—There is no degree in Architecture.

4598. But there is a course of training. Does the training in University College, London, form part of the curriculum for a diploma in Engineering, or is it separate?—In King's College they give a "College certificate" in Architecture and the Associateship of the College (A. K. C.).

4599. Professor DICKEY.—Does the new London University not give a degree?—No.

4600. Is it not in contemplation?—It is, I believe, in contemplation; but the R.I.B.A. is not well satisfied with the position of affairs. The Gresham Commission proposed Architecture as an independent faculty, but the result of the late formulating of the scheme has been to leave out "Architecture" altogether from the various faculties, and it is supposed to be included either in the Faculty of Science or Engineering.

4601. Mr. Justice MADDEN.—Your suggestion is that in a properly constituted University system there should be a separate Faculty of Architecture, with a corresponding degree, and a School and Professors in which, and by whom, Architecture should be taught?—Precisely; on the plan of the American Universities.

4602. Are there separate degrees?—The degree is Bachelor of Science, and that is given for all the branches; but you can take it either in Mining, Engineering, or Architecture.

4603. You can specialise?—Yes; at Massachusetts there are nearly 100 students in Architecture at the present moment, where they pursue a four years' course. They have passed or given degrees to 176 since they opened, in 1873, including half-a-dozen ladies.

4604. Would your idea be that the students should matriculate in a University and pursue an Arts course up to a certain point, and then specialise?—The course at Liverpool seems very nearly as it should be. A student must matriculate in the usual way. He must then take Arts subjects, and at the same time take up some portion of the Architectural course in the first year. The second and third years are devoted entirely to work in the Architectural School.

4605. Most Rev. Dr. HEALY.—But he specialises to some extent, even in the first year?—Yes. The Liverpool School is, I think, a little deficient in Science, but, as Mr. Simpson says, you cannot do everything at once. Of course, the difficulty in an architect's training is this: so to adjust Science and Art that a student gets fairly trained in both. Afterwards he may specialise, and one may become more of a constructor, and another more devoted to the artistic side of the work; but it is of great importance that these two faculties should be trained together. The great object of the training should be to enable the student to understand the true relationship of Science and Art to Architecture.

4606. Mr. Justice MADDEN.—Supposing that there were a separate school leading up to a degree, what do you suggest as to the course of training prescribed—what should it include?—It should include, in the first instance, a certain amount of general culture, the elements of an Arts course. It should then include Drawing, pure and simple, Painting, Modelling, and everything of that kind. It should include a special study of the history of Architecture, because it is only by a review of the finest works that man has produced that the taste of the student can be formed and elevated. The subject of the history of Architecture should not be approached from a purely archæological point of view, but should also be treated so as to show how Architecture developed. I believe that in that way what we are all seeking for at the present day, a new style, is more likely to arise than by mere copying. The Science should be treated from the constructional point of view, and should be taught, of course, by a specialist.

4607. Has your attention been called to the syllabus of the courses in the department of Architecture and Construction set forth by the University College of London?—Yes.

4608. In a general way, does that agree with your views?—In a general way; but it is deficient in the necessity for an Arts course.

4609. Are there any other remarks that you wish to bring before us?—My chief point is to bring before you simply the needs of the profession. I think the examination system of the Institute shows that it is of importance to bring before the State and before the public the need of the profession in regard to education. It is all very well for the Institute to say what they require, but it is the duty of the State to work up to, and to supply what the profession requires.

4610. Do any considerable number of fully-qualified architects under the Institute hold University degrees?—A very small proportion, for the simple reason that very few men can afford the time. If a man goes for an ordinary Arts degree, that gives him enough to do for two or three years and postpones his studying for his profession.

4611. But if the status of a degree qualifying as an architect acquired by studying in a University were given, I suppose you are of opinion that it would tend to elevate the profession greatly?—Certainly.

4612. Because there would be an element of liberal education introduced outside the mere professional training?—Yes. There has been an effort made before Parliament two or three times during the last few years, to get a system of registration for architects legalised. A certain number of men think that would be a panacea for all the ills of the profession; but other men are of quite an opposite opinion. If Parliament were to organise an arrangement of that sort every man who ever designed anything, however humble—a

* Prospectus of Day Classes in Arts, Science, and Law for the Session 1901-2, in University College, Liverpool. University Press of Liverpool, 1901, page 154.

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builder's clerk who had designed a labourer's cottage for a Board of Guardians—could demand to be registered as an architect under the Act of Parliament.

4613. Is it called a diploma, or a certificate, what is given by the Institute?—It is only an admission to the Associateship.

4614. Most Rev. Dr. HEALY.—And the Fellowships?—The Fellowships afterwards follow from the Associateship. A man must be an Associate for five years before being eligible for a Fellowship.

4615. Mr. Justice MADDEN.—What proportion of those who are employed as architects in Ireland have that qualification?—You mean being members of the Institute?

4616. Yes?—In Ireland, I should say there are very few. I really could not name one who has taken the Institute examination. There may be some in Dublin and Belfast.*

4617. There are no qualifications legally necessary to constitute an architect?—No.

4618. It differs, in that respect, from other professions; but what is the usual educational qualification of an architect?—Well, it depends upon the individual's standard. With some men it is just their name on a brass plate. That is what we complain of.

4619. Probably you would answer that, as the Universities have not recognised it as a separate school it is very difficult to define what is the qualification of an architect?—That is so. There are no opportunities for young men to study Architecture, except in Liverpool. I have sent my son to Liverpool within the last few months, simply on account of the facilities for study there. There are some men in London who go to King's College, or to the Association School. They get education there, but they get no qualification: no stamp of a degree from it.

4620. Professor DICKEY.—Liverpool is the only place where they can get a degree?—The only place in the United Kingdom. The degree was only created last year.

4621. Most Rev. Dr. HEALY.—How would you propose for Ireland that degrees should be given in Architecture? Would it be the degree of Bachelor of Science?—That is as it may be. So long as some mark is given I would not care; but Bachelor of Science, probably, would be the best. There is a Bachelor of Science degree given in America.

4622. You are aware that in the Royal University the first year's course is not special or professional in any way; it is a general Arts programme. Would you be in favour of that for architects?—Certainly.

4623. It would be time enough to specialise at the end of the first year?—Certainly. The point I wish to put is this. The education of the architect should begin from the University course. In a few years you would have a body of really educated architects, and the public would then discriminate.

4624. Professor LORRAIN SMITH.—You intend to lead the public to discriminate, and not to have legal restrictions?—I don't believe in legal restrictions, such as registration. That would be beginning from below, and every man who practises, no matter what his standing, would be legally qualified to rank as an architect.

4625. What number of students would there be in the faculty—what number would you naturally expect?—I don't suppose I would expect from Cork more than a-half dozen.

4626. Dr. STARKIE.—How many are there at present?—in the Engineering School there are about sixteen or eighteen at present.

4627. Professor LORRAIN SMITH.—That is one side of the Engineering School. You would contemplate an all round faculty giving a degree in Architecture?—Yes. Cork is a very small place; and my scheme is very much broader than for Cork.

4628. There are a large number of architects in Ireland?—Yes; a good number of them are in Dublin. There must be a large number here.

4629. Do you happen to know in what the Liverpool School of Architecture originated?—I think it was at the instance of some private person or body.

4630. Was it the architects of Liverpool asked for it?—I don't know exactly how it sprang up.

4631. Professor DICKEY.—There are two ways in which Architecture might be provided for: by education in a University, or in a Technological Institution such as in Manchester. You prefer the University?—I prefer the University for two or three reasons. In the first place, a Technical School does not aim at general culture, and in the next place the aim of a Technical School is to give the artisan who has the use of his hands or his tools as much Science as he can take. That is not at all the training for an architect. An architect need not be a craftsman. It is not necessary for an architect to be able to play billiards in order to design a billiard room, but he must know the size of the table and the length of the cue. It is not necessary that he should be able to take the tool out of a plumber's hands and solder a joint; but he should know the theory of these things. I think the subject would be better approached in a University than in a Technical School.

4632. You think it should be associated with Engineering?—Yes; Engineering as taught in a University.

4633. Would you practically make it part of the Engineering Faculty, and make every Bachelor of Engineering study Architecture, and every architect acquaint himself with the principles of Engineering?—Certainly; the two professions should be worked together, and taught together, up to a certain point; but time is a consideration in the subject, and you could not expect an architect to spend a great deal of his time studying the higher Mathematics, perhaps more or less distasteful to his temperament, nor would you oblige an Engineer to study Painting and Drawing until he got sick of the whole subject. There must be specialisation.

4634. But the architect of the highest type would, in your opinion, be produced by the University?—Yes. University training should produce a man of general culture, a scientific attitude of mind, and with his artistic temperament developed. He should know so much about all subjects as to be able to control those under him. Take, for instance, these modern American buildings of steel. They require an amount of calculation that an architect need not necessarily do himself, but he should know enough about them to be able to control the man whom he employs to make them.

4635. You have visited Belfast and Derry?—I have. In my opinion the whole country should be afforded facilities in this respect.

4636. Are there some buildings in Belfast which show a lack of Architectural Science on the part of local architects?—I don't know about that; but in Liverpool, recently, I happened to see a building of most charming design, but all the mouldings in front were run without any regard to the stone joints. That design was made by some young draughtsman, and handed to the builder to carry out in any way he liked. The real spirit of Architecture is that design should be based on construction.

4637. Mr. Justice MADDEN.—I think Mr. Ruskin has expounded that doctrine with great beauty of language and clearness in his "Seven Lamps of Architecture"?—Yes.

4638. Most Rev. Dr. HEALY.—Are we really to understand—I am particularly anxious to know it for my own information—that we cannot ascertain for certain that we are dealing with a qualified architect?—No; there is no means of ascertaining that. Young men simply start as architects, with or without education.

* "I have just received a list of the Students who have passed their Entrance Examination for the R.I.B.A., Dec. 1901:—R.I.B.A. Examinations—Preliminary—151 passed (including 2 Irish Students from Cork); Intermediate—45 passed (including 1 Student from Belfast); Final—35 passed (no record of an Irish Student)"—Arthur Hill, Dec. 11, 1901.

The Witness withdrew.

ROBERT BLAIR, Esq., M.A. (Edinburgh), B.SC. (London), Assistant Secretary in respect of Technical Instruction of the Department of Agriculture and Technical Instruction for Ireland, examined.

4639. Mr. Justice MADDEN.—You are Assistant Secretary in respect of Technical Instruction in the Department of Agriculture and Technical Instruction for Ireland?—That is so.

4640. You are a Master of Arts of Edinburgh University?—Yes.

4641. And Bachelor of Science of the University of London?—Yes.

4642. Before you were appointed to your present position you were an Inspector in Scotland in connection with education?—I was an Inspector of Schools. I was appointed by the Science and Art Department then—the Board of Education now—and was afterwards transferred to the Scotch Education Department, so that I have had experience of the Science and Art Department, the Scotch Education Department, and this is my third Department.

4643. Were you inspector of Secondary or Primary Schools?—Of Science and Art Schools.

4644. You are aware that we are at present inquiring into Technical Education in relation to University Education?—Yes.

4645. And, therefore, the general question of Technical Education is outside our scope except in so far as it may be considered leading up to or connected with University Education?—Yes.

4646. In your evidence you will bear that in mind. We ask you to proceed now in your own way bearing in mind the special object of our inquiry, which, to a great extent, opens up the general question of Technical Education, within, however, the limits mentioned?—Perhaps you would allow me at first a word or two with regard to some general considerations. In dealing with a general or a liberal education one has to have regard to the instruction of the whole man, whether you are thinking of him morally, physically, or intellectually. You want to bring out his best powers, so that on all occasions and in all circumstances this man will, I may say, use his best powers. Technical instruction is really a restricted view of that; in the technical instruction of an individual, we have regard rather to these qualities which have a commercial value; but it would not be possible to follow that quite to its logical conclusion, and we have been prevented, as I hope to show later on, by Acts of Parliament, otherwise we might find ourselves preparing acrobats and fat women and other things of that kind. I would like it to be clearly understood that in dealing with technical instruction I am dealing with it only in non-agricultural subjects. I propose to say a word or two as to what has been done in England in that respect, also a word or two as to what has been done in Scotland. In England we find that last year no less than £980,000 out of the Residue Grant, Local Taxation, Customs, and Excise Act was available for technical instruction, but that sum was spent on only one form of technical instruction. There was also a large grant amounting to £400,000 in round figures as a Science and Art vote. The Board of Education in England has two sides—a Primary and a Secondary side. The Primary side of the work of the Board of Education involves some technical instruction in Science and Drawing and in Manual Instruction, while the Secondary Department of the Board of Education deals generally with Secondary Education, but specially with Science and Drawing and Manual Instruction also. Now, the Board of Education Secondary Department deals with technical instruction from two points of view, either the day point of view or the evening point of view, and you will find that of the day schools in England there are three types. There is, first, the Grammar School type; then there is the Municipal Technical School type, a Day Municipal Technical School. A Municipal Authority finds it must build a Central Technical School. What to do with their evening staff in the daytime is usually a difficulty. So generally a Day Municipal School is started, and that becomes a school chiefly for instruction in Drawing, Science, and Manual Work; but it adds on a sufficient amount of general education to enable it to come within the regulations of the Board of Education. The third type is the Higher Grade School. The Higher Grade School is a Primary School with a Secondary top. Those are the three types that are dealt with by the Board of Education. But there are, in addition, higher types, *e.g.*, Finsbury Technical College, the Day Technical School, in the Manchester Technical School; and such schools as the University Colleges and so on. These schools are not directed or controlled by the Board of Education, which, however, does control one school of the higher type, viz., the Royal College of Science, London. There are thus three stages, Primary, Secondary, and Higher. In addition to that work of the Board of Education there is a great deal of work carried on with the help of the £980,000 previously referred to. That is carried on by means of the counties and county boroughs. A county borough is, I think, a town of 60,000 inhabitants. The counties and county boroughs form Technical Instruction Committees, partly consisting of members of the County or Town Council and partly co-opted, but the balance of power is usually in the hands of the Municipal Authority. For instance, in London the County Council Technical Instruction Board consists of twenty Councillors and fifteen co-opted members. These authorities found themselves in a very great difficulty in England. While they were very frequently composed in the counties of gentlemen of University Education, and in the towns, on the other hand, were composed of business men, they found themselves unable to grapple well with this question of Technical Education, and practically all of them that had the funds at their disposal to do it, appointed an Organising Secretary. The Organising Secretary has nothing to do with the Board of Education; he is appointed under the County Council from those funds referred to—the £980,000; and those funds are administered, one might say, without even asking for the approval, and certainly without the interference of the Board of Education in any way. These local authorities have assisted Evening Continuation Schools; they have assisted Science and Art Schools, and they have assisted schools like the Polytechnics in London; and, in some cases, they have gone further, and directly provided a school, for example, a furniture school, or a printing school. That is a general brief description of the position in England.

4647. Professor LORRAIN SMITH.—What is the source of this £980,000?—It is commonly called the Residue Grant under the Excise and Customs Act.

4648. For the County Councils?—Yes.

4649. Mr. Justice MADDEN.—The Act of 1890?—Yes.

4650. Professor LORRAIN SMITH.—That money was used to establish the Wye Agricultural College in Surrey?—I believe so, but I cannot say positively as to that. On looking up the figures for last year I find that the amount of Residue Grant was £980,000 in England, and there was spent £886,000 on Technical Education. The remainder went in relief of rates. The money was spent in the following ways:—In directly supplying technical instruction, that is, the Council doing it themselves, £332,000; in Evening Continuation Schools, £44,000; to assist Science and Art Schools, £141,000; to other institutions, £86,000; for Scholarships, £114,000 (a very large item indeed), that is a special feature of the county schemes in England. The local authority find a Secondary School, planted in a good situation; they offer Scholarships, open to the county, and thus bring in the pupils to the schools. They cannot take the schools out to the districts, so they bring the pupils in.

4651. Mr. Justice MADDEN.—From the Primary to the Secondary Schools?—Yes, by means of the Scholarships.

4652. It would be very interesting to know whether there is any corresponding means of bringing them up from the Secondary Schools to the University—that would complete the ladder from the Primary School to the University?—There are University Scholarships. To continue—for administration purposes they spend £63,000, and other purposes, £41,000. In Scotland things are quite different. Although, in the main, the same idea runs through both, the fact that in Scotland you have one authority administering most grants and dealing with education makes a great difference. In England you have the Board of Education, you have the county authorities, and also Examining Bodies, like the City and Guilds; but the county authorities are far more in direct contact with the Scotch Education Department than are the county authorities in England with the Board of Education. The Scotch Education Department has within its control Primary Education in every form, and also Secondary Education, but not University Education, Primary and Secondary Education, Science and Art Schools, Evening Continuation Schools, and Evening Technical Schools—they are all under one Department.

4653. The Scotch Education Department is different from any institution either in England or Ireland. It differs from the two Boards which we have in Ireland, one administering Primary, and the other Secondary or

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Intermediate Education. Is it not a Government Department with a permanent head, Sir Henry Craik, and a Minister who is responsible in the House of Commons, and with funds that are derived from voted moneys, is not that so?—That is so. There is only one Education Department in Scotland. In England, although they have got one Board of Education, it is really in two sections—Primary and Secondary. And then there are the County Councils, who are acting without central direction or control. In Ireland you have the National Board, the Intermediate Board, and the Department of Agriculture. But, I believe, the framers of our Department followed the Continental model, which aims at co-ordination, and which keeps all that relates to practical education, *i.e.*, technical and agricultural instruction, in the hands of Departments of Agriculture and Industry, rather than in those of purely Education Departments. In Scotland, I would like to say that, with regard to Primary Instruction, Drawing, Hand and Eye Training, and Science and Manual Work are the forms of technical instruction. As to the Secondary Schools, over twelve months ago, in August of last year, the Scotch Education Department issued a minute dealing with Secondary Schools, making provision for Drawing, Science, and Manual Instruction on lines somewhat similar to those which have been adopted by the Department of Agriculture and Technical Instruction for Ireland and accepted by the Intermediate Board, and I shall deal with this more fully when I come to tell of our own Department's work. The Secondary Schools of Scotland are, practically, all compelled now by the Scotch Education Department to give some instruction in Science and Drawing. They are not compelled to take up Manual Instruction.

4654. Professor LORRAIN SMITH.—To every pupil?—On the whole, yes.

4655. Mr. Justice MADDEN.—You say compelled? What form does the compulsion take? Is it in the form of withholding grants?—The minute of the Committee of the Council of Education in Scotland, dated the 24th August, 1900, provides for the administration and distribution of grants for Science and Art in Scotland. I may just preface what I am going to say on this with the statement that the Scotch Department has the control of the Secondary Schools as regards the funds other than the Science and Art grants. It administers to a certain extent the endowments of Scotland, which amount to £200,000. It administers a grant of £60,000 for Secondary Education, and another grant of £35,000 for Secondary Education,—practically £300,000 for Secondary Education, in addition to Science and Art grants, of, say, £12,000. A Department with funds like that at its disposal, can bring a great deal of pressure to bear on a school to make its education modern and as good as possible. This is the minute, and I will hand it in. I don't think it is necessary to go into details in this matter. [*Witness hands in Minute.*]*

4656. We do not think the details as to Primary and Secondary Education in Scotland are very germane to our inquiry?—Very well. In Scotland the County Councils also have a system of Scholarships leading up to Secondary Schools, and the Universities all have what is called a Bursary system. There are some County Scholarships leading to the Universities, and most of the Universities have a number of Bursaries attached to them. There is a competition at the beginning of every session for these Bursaries or Scholarships.

4657. Are these Bursaries obtainable in subjects connected with Technical Education or in general education?—In general education, Classics, Mathematics, English, and Dynamics, which simply means mathematical examples, chosen from other than purely mathematical fields.

4658. Dr. STARKIE.—Are those Bursaries obtained by pupils in Secondary Schools only?—They are obtained by open competition.

4659. The successful students, I suppose, mainly come from the Secondary Schools?—Mainly from the Secondary Schools, but the competition is not restricted to those pupils.

4660. Are there in Scotland Bursaries, for instance, in the Secondary Schools, open to competition to a boy from the Primary Schools?—There are the County Scholarships.

4661. Mr. Justice MADDEN.—With regard to that very excellent system of Bursaries leading from the Elementary Schools up to the University, so far as I understand it, those Bursaries are given for education generally, and are not specially allocated to Professional or Technical Science?—No; the Science subject at present included is Dynamics, but I would like it to be fully understood that the Scotch people don't agree with that exclusiveness.

4662. Professor LORRAIN SMITH.—But they are given by the University and not by the Department?—Yes, they are given by the University.

4663. The Universities are so well provided with Bursaries that there is no need for the Department to add to them——

4664. Mr Justice MADDEN.—Now, will you proceed to the Irish aspect of the question?—Yes; I have indicated in the brief statement of my evidence that I would like to deal with this in three forms. The two forms that I have already alluded to are the Day School work, and what I may call the Technical Instruction and Local Authority form. The third one I will deal with afterwards. Now, coming to Primary Schools in Ireland, that is the work almost entirely of the National Board. When I say "almost entirely," I am thinking of some ninety-two schools with some 16,500 pupils. These schools receive Drawing grants from the Department of Agriculture and Technical Instruction. Those grants were not created by the Department: they were grants given, and which have been given for many years, to schools not working under the National School regulations. In fact, they are mainly Christian Brothers' Schools. Seventy-five of those ninety-two schools are Christian Brothers' Schools. Those grants were transferred to the Department when the general transfer of the administration, so far as Ireland is concerned, of the Science and Art grant, was taken over in the April of the present year. Those ninety-two schools teach Drawing in accordance with the regulations laid down by the Board of Education.

4665. If there were anything in this leading up to the University question, it would be germane to our inquiry. It is very difficult to segregate the question, and we think your best plan will be to proceed, bearing that in mind, so that you may be able to exclude certain matters of detail?—These Primary Schools are teaching Drawing in accordance with a programme of the Department. The Department started work at a rather opportune moment. We found the National Board preparing to deal with Science instruction in the Primary Schools, and we found the Intermediate Board, with a new Act, proceeding to deal with practical instruction in their schools; and the Department issued a programme, of which you have no doubt a copy,† and the Intermediate Board adopted that programme. The work is now going on, and although we have no absolutely reliable details at this moment, I think there are 160 schools giving instruction in accordance with the terms of that programme.

4666. Dr. STARKIE.—I suppose these 160 schools are fully equipped with laboratories?—I would not like to say they are fully equipped at the present moment. For the present session some of the schools have been allowed to put up temporary laboratories on the distinct understanding that they will make complete laboratories next year. Many of them are now fully equipped. These schools were found almost without laboratories; and it has taken a great deal of time to plan laboratories for them. We also found a good many of them were without teachers who had experience of Practical Science instruction, and to deal with that the Department decided that, at any rate for the present, there was no possible good method but that of summer courses. It was laid down quite clearly that a summer course of 100 hours' instruction would certainly not be enough for the preparation of a teacher to give instruction in the courses in these schools, but it was held to be the best thing that could be done at the moment, and courses were arranged in Belfast, Dublin, Cork, and in four or five Convent centres, to prepare the teachers to give this instruction in the following winter. They really had three weeks' concentration of attention on the work of the following winter. The figures are given in the Department's report, but we had no less than 293 teachers at these classes, representing 196 schools. The classes were in Science at the Queen's College, Belfast, in the Royal College of Science, Dublin, and the Christian Brothers' Schools, Cork, and we got the best teachers we could get for them.

4667. Were these representing Primary Schools or Secondary Schools?—They were entirely representing Secondary Schools, the schools in which it was proposed to get the programme referred to to work during the present session.

4668. Professor LORRAIN SMITH.—Some of them were ladies' schools?—Yes, some ladies' schools.

4669. Mr. Justice MADDEN.—All Intermediate Schools?—All Intermediate Schools. Some of the best Science teachers and Drawing teachers were in ladies' schools. We had no less than 196 schools represented

* See page 272.

† See page 232.

at the course, and the Department was able to give certificates of qualification to teach the first year's course to many of these Science teachers after an examination held by an outside gentleman, who had no connection with the course. The Professors were allowed themselves to mark the teachers' work. They had the teachers three weeks in the laboratory, and, therefore, had ample opportunity of gauging their knowledge, skill, and qualification to teach. The Department settled who were qualified to teach during the present session and who were not qualified to teach. It is proposed to repeat those courses session after session for four or five sessions.

4670. Dr. STARKIE.—What proportion of the 296 teachers got certificates qualifying them to teach?—I did not bring the figures with me, but speaking so far as my memory goes, of about 150 who attended the Science course, I think I might say 130 got a certificate to teach for the present year. The rest had a Drawing course, and no teacher in that course got an absolute qualification in any subject. We accepted the qualification of the best of them, about four-fifths of them, and said that those would be allowed for the present session; but in future the Art teachers will have to strive to get the certificates which are stipulated in the Department's regulations. I think that is all I have to say with regard to the special course for teachers. There are 160 of those schools now at work, in addition to, perhaps, fifty more, which have taken up Drawing as a separate subject under the Intermediate Board. That is the work that is going on at present in Irish day schools; the funds which support this work, viz, the Science and Art funds, have nothing to do with the Department's endowment. These funds are part of the transfer from the Board of Education. There is a third part of the transfer—that is the evening Science and Art classes. Now, we had such an expenditure of time in getting laboratories into the day Secondary Schools, that we thought it better at the present moment to make no alteration with regard to the evening schools, and, so far, the Department has accepted the Board of Education regulations almost as a whole. A circular was sent out to the schools, making some modifications, so as to make these regulations applicable to Ireland; but, on the whole, the Department accepted the regulations for the Evening Science and Art Schools. They are assisted out of the vote that was transferred. That vote was, as you know, a small one. We come now to the Department's Technical Instruction Fund proper—the £55,000 which the Department has, under the Act of 1899. That sum of money was, with the concurrence of the Board of Technical Instruction, divided into portions, and £25,000 was allocated to the county boroughs, to be divided among the county boroughs according to their respective populations, and £30,000 for the purpose of technical instruction outside the county boroughs—what we might call the rest of Ireland. A sum of £3,000 was reserved out of that for central purposes, and the other £27,000 has been dealt with or administered under a scheme of distribution, in which the Board concurred. The Department has endeavoured, by means of its officers, to deal with local authorities on the spot. Let us first take the County Councils. They have, as in England, Technical Instruction Committees, partly County Councillors, partly co-opted members, and we have had a great deal of correspondence and conference with those Committees, and we have worked up schemes with them, so that, on the whole, we have now framed nineteen county schemes and twenty-five urban schemes, including the six county boroughs. Those schemes are by no means all in working order yet. With regard to the county schemes, I might mention that the North Tipperary scheme (I have got it here, and shall put it in)* may be taken as an example of a good county scheme. With regard to such towns as Ballymena, Coleraine, Wexford, Dundalk, Drogheda, and some others, we have dealt with those independently, and we have given grants. For example, Coleraine got a grant of £400, to enable the Urban Council, or Technical Instruction Committee, to form a Technical School in Coleraine. Rathmines will get £600. The object of the school there is a very special one, to make a higher School of Commerce. I don't mean Book-keeping, Typewriting, and Shorthand so much, but Economics and higher teaching.

4671. Professor DICKEY.—Are these annual grants?—Annual grants, and Wexford will get £400. As to the county boroughs, their schemes, of course, depended on the share of the £25,000 which they would get when the division was made, according to the respective populations. I think we might say, in round figures, that something like £10,000 will come to Belfast, and something like £10,000 will come to Dublin, and, relatively, smaller sums to other county boroughs—Waterford, Derry, Limerick, and Cork. With regard to the county boroughs, we might take Belfast first. The Town Council formed a Committee, partly of Councillors and partly of co-opted members, but in addition to that, they had Consultative Committees, expert Consultative Committees—one of educational experts—and another of manufacturing experts, and, after consulting the Department, one of the first things they did, in January of the present year, was to appoint a Principal, at £600 a year—Mr. Forth—who was an assistant director in Manchester. During the year, up to August and September, he has been engaged in what I might call preliminary work; and Belfast has done a good piece of work by amalgamating the Science and Art and Technical Schools in Belfast, and working one common scheme for the whole city. The Technical Instruction Committee mean, ultimately, to build a school, costing £70,000, but they intend that while the school is being built they should prepare the pupils to fill it when it is built. A little while ago it was estimated that they might have 1,800 tickets taken out by students during the present session, but, in point of fact, they have taken out no less than 3,900 tickets. It was estimated that something like £260 would be paid in fees, and they have already collected over £360 in fees. So much for Belfast. Dublin has not got so far with its scheme. Cork has a scheme similar to that of Belfast—a School of Art and a School of Science, both forming one common Municipal Technical School. The Technical Instruction Committee have appointed a head-master, and are proceeding satisfactorily. The other urban centres have their Technical Schools working; and, perhaps, it would not be out of place to mention generally the number of pupils they have in these schools now. Dublin has 1,141, Belfast 3,964, Cork 706, Limerick 206, Londonderry 225, Ballymena 300, Coleraine 304, Larne 273, Lurgan 260, Rathmines has not been opened, but it will be opened in January; Kingstown 314, Pembroke 250, Blackrock 150, Wexford 67. There is some mistake about Waterford, but I should say the number is about 200.

4672. Dr. STARKIE.—These numbers don't represent the average attendance?—No; these are the numbers on the roll. These schools have been in the main created during the present session.

4673. Mr. Justice MADDEN.—What do you mean by created—take Coleraine, for instance, where there was an existing school. Is this an absolutely new school, or do you mean that it is the technical side of an existing school which has been created?—There was no school in Coleraine up to the present—no Technical School.

4674. Do you mean that they are created so far as they are Technical Schools, or that new schools have come into existence, which are Technical Schools?—I first spoke of Primary and Secondary Schools, and in dealing with Technical Schools, I was not thinking of Primary or Secondary Schools. There are Primary and Secondary Schools in Coleraine.

4675. They are absolutely new schools?—Yes. There were no funds for the purpose before. As to Belfast, I said they amalgamated the schools previously existing.

4676. Professor DICKEY.—In Derry there was a pre-existing school—the School of Art?—It was taken over by the municipal authority; in Cork, the School of Art was taken over. Both are adding large Science sides.

4677. Professor LORRAIN SMITH.—And have new teachers also, I presume?—Yes. There are one or two further remarks I would like to make with regard to the continuation of day school work. We have had Primary and Secondary Schools, and now I will deal with a higher form of this work, which the Department is dealing with—the College of Science on one side, and the Metropolitan School of Art on the other. The College, I dare say you have been told, is to be reorganised, both as regards buildings and staff, which will be increased; and it will become more of an Applied School of Science than it has hitherto been. I notice, in all the reports dealing with it, that it has been called an applied school, and it is the endeavour of everyone to make it more of an applied school than it has been.

4678. Mr. Justice MADDEN.—Before you pass to the reorganisation of the School of Science prior to the constitution of the Department of Agriculture and Technical Instruction, was not the Royal College of Science under the English Board of Education, and administered in popular language from South Kensington?—That is so.

4679. South Kensington is a Department of the Board of Education?—South Kensington has now be-

* For the explanation of the chief features of the Scheme of Technical Instruction for North Tipperary, see First Annual Report of Department of Agriculture and Technical Instruction for Ireland, page 61.

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become the Secondary Branch of the Board of Education.

4680. How were the Professors in the Royal College of Science appointed before the transfer—while the School of Science was under the Board of Education?—They were appointed by the Board of Education.

4681. Were they appointed by the President or the Council—in whom was the patronage vested—perhaps you don't know?—I could not say exactly; I can state my belief. The appointment was in the hands of the President or Vice-President of the Council for the time being.

4682. Do you know the tenure of office of the Professors in the College?—They are pensionable officers—Civil servants.

4683. They hold a Civil Service tenure?—Yes.

4684. They are Civil servants?—Yes.

4685. The College was under the Board of Education, and the patronage of every office in connection with the Board was in the hands of the Vice-President?—Yes.

4686. Now, it becomes a branch of your Department, and the appointment of Professors is in precisely the same position as in the case of other officials of the Department?—Quite so.

4687. I presume the tenure of the officials of your Department is the ordinary Civil Service tenure?—Yes. There is one thing I have not referred to, and that is the third form of technical instruction. I said technical instruction usually took two forms—that in the day school, and that in the evening school, and I have dealt briefly with both, but there is a third form which, to my mind, would have an influence on industry, and be a direct preparation for industry. I have here a pamphlet, which I will hand in, which is "A Report on the Teaching of the Principles of Boot and Shoe Manufacture in Northamptonshire."* Work of that class is work of direct preparation; and then there is a second form of this third form—the scheduling of resources, material, intelligence, and skill, and the bringing of these together, and the scheduling of information about markets, and means of transit, and so on. That has been partly done in England by the Foreign Office, partly by the Colonial Office, and partly by the Board of Trade. None of these have given direct instruction bearing on industrial work, but they have collected and distributed information. Direct industrial teaching is a phase which we shall have to give some attention to in Ireland. But it is a very complicated question—so complicated that, if you would not mind, I would like to read a paragraph in the Department's Report, bearing on this matter, and wherein the views of the Department are exactly stated. It states:—

> "Besides this development of Secondary Schools and the promotion of Evening Continuation Schools, to provide for the education of boys whose schooling has been abruptly cut short by their going into employment, the system of the Department will include the establishment, through the medium of existing schools and otherwise, of special Technical Schools for Industries and for Agriculture. In connection with Agriculture—apart from the difficulty of getting teachers, which must continue with diminishing intensity for a few years, until a supply of expert agricultural teachers has been trained—the organisation of such Technical Schools presents a comparatively simple problem. Agriculture is a great and living industry, universally pursued in Ireland, and whether these agricultural schools arise in connection with Secondary Schools, or are independently organised and, probably, they will appear in both forms—their problem will be to adopt their teaching to the service of the industry which is at their door. Their chief perplexity will be how, with most economy and practical effect, to diversify their work so as to suit the different agricultural conditions of different parts of the country, and the different classes of service—that of the working farmer, that of the agricultural scientist—for which knowledge is required. It is otherwise with technical instruction intended for the purpose of industries other than Agriculture. Outside the large cities, where Technical Instruction Schemes are being successfully inaugurated, there are few towns in Ireland where any such industries exist. Moreover, a striking difference, which it is most important to appreciate, thus appears between the problem of technical instruction in Ireland and that problem in Great Britain. In the towns of England and Scotland technical instruction has but to adapt itself to existing and flourishing manufactures. In no locality does any doubt or question arise about the industries to be served. The scheme of technical instruction is called on to provide its pupils with skill and knowledge, mainly imparted in the evening, to be applied to industries which they are working at during the day. In the majority of the provincial towns of Ireland, beyond the artisans connected with the building trades, there are seldom workers enough engaged in any industry to which technical instruction could properly be applied to furnish pupils for a class at a Technical School. This somewhat baffling difficulty, which confronts the Department in the organisation of its educational system, it is desirable to have fully realised. It means that part of the problem of technical instruction in such localities must be, how to promote industries to which it may be applied; and that, consequently, through exceptional Irish necessities, the Department may be obliged to give more attention to this mode of action than it might otherwise have found it desirable to do. It means, moreover, that, outside the large cities, that phase of technical instruction which approaches more nearly to the direct teaching of trades or handicrafts to workers insufficiently prepared in the elements of Science and Art, will, for a time, have to be more resorted to in Ireland than is the case in more developed countries. But this, in its irregular applications at least, will be but a temporary phase. Technical instruction in its true and permanent conception, as a specialised but organic part of general education, whose aim is so to train a man as to render him morally, intellectually, and physically master of his best aptitudes, and able to apply these aptitudes in every fitting direction that opportunity offers, will always be before the mind of the Department. It is from men so trained, from their inventive brains, their skilful hands, their developed and self-trustful personality, conscious of powers, and seeking for opportunities to use them, that the true advancement of a nation's industries must come. This has been the history of technical instruction, even in countries which, like Ireland, have started without industries, and which have also had to try the temporary phase referred to."†

That is briefly all I have to say.

4688. Mr. Justice MADDEN.—Have you formed any views as to the future of the Royal School of Science, assuming the establishment in Dublin of a teaching body, whether a University or College. Have you formed any ideas as to the relations in future of the School of Science with that body?—I have.

4689. If you have thought out that subject we should be glad to hear your views?—One gets an idea from my own University of Edinburgh, where you have extra-mural schools. It has occurred to me that in dealing with the new University the classes of the College of Science might be recognised. For example, it is a good thing to give a man who goes through a Technical College a degree. If he went first to the University, passed his entrance or preliminary examinations, and took out a year there, he might afterwards go to the College of Science and have some part of his University time counted at the College of Science, and then go back from the College of Science to his University, and complete his degree work, counting the courses of the College of Science for the degree.

4690. Suppose the degree was that of B.Sc.?—That arrangement might hold.

4691. It has been brought before us very clearly by a preceding witness that, having regard to the enormous expense of fully equipping a College or school for the teaching of Practical Science, it would be desirable to utilise the existing institutions for the purposes of various teaching schools or Colleges?—Yes.

4692. He stated the expense of equipment with laboratories and other appliances in Manchester was estimated at £80,000—does that view commend itself to your mind?—It does.

4693. The expense in connection with the establishment of Technological Schools is much greater in modern times than was estimated a few years ago?—Yes; and it is growing at an enormous pace.

4694. In connection with electrical appliances?—Yes, and mechanical engineering, and chemical trades. Chemical Science is finding its connection with chemical trades—dyeing, for example—and the work requires to be done on a large scale. One of the mistakes made in this country has been in dealing with such subjects on a small scale. Now, however, laboratory teaching in the large Technical Schools approaches day by day more nearly to commercial conditions.

* See Journal of the Department of Agriculture and Technical Instruction for Ireland. Second year. No. 1. Sept. 1901. Report on the Teaching of the Principles of Boot and Shoe Manufacture in Northamptonshire, by E. Swaysland"), page 49.
† See page 244

4695. Though the education given in the University or College, without this elaborate preparation, might be of a very high class, so far as abstract Science went, it would be inferior in relation to Practical and Applied Sciences to that given in a fully-equipped Technical School?—It ought to be. The Technical School should be giving the very highest and best quality of instruction in its laboratories.

4696. And your idea coincides with that of the witness to whom I have referred, that there might be a very useful collaboration between the University or Teaching College and the Technical School?—I think so.

4697. Most Rev. Dr. HEALY.—With regard to the utilisation of the College of Science for the purposes you have indicated, it would cost a good deal of money to equip it properly?—It would cost a great deal of money.

4697A. We were told that the Manchester Technological School will cost £80,000 to equip. If we have in Dublin an institution properly equipped it would cost £30,000 or £40,000?—A Dublin institution properly equipped from the start?

4698. Mr. Justice MADDEN.—That £80,000 was for mere equipment, exclusive of buildings and acquisition of lands, the cost of which, in Manchester, would be enormous?—I daresay.

4699. Most Rev. Dr. HEALY.—It would cost a large sum, at any rate?—A large sum indeed. In dealing with the College of Science, it has to be remembered that there have been additions to the laboratories and apparatus from year to year, so that it has a fair stock to start with.

4700. In England they don't find it desirable to have technical institutions for Agriculture, and what you might call the urban branches of Technical Science in the same institution. They separate them?—I don't know much of Agricultural Schools.

4701. Would you think it possible to have this College of Science in Dublin so equipped as a great high technical institute as to be available not only for the purposes of the manufacturing industries, and so forth, but also for the purposes of an agricultural technical institute in Dublin?—I should think so.

4702. Would you think it more desirable to separate the institutions and have your College of Science in Dublin, doing the work it is doing at present, but in a much more perfect way, and let the Agricultural Technical Schools be organised elsewhere?—We have to look at that from the point of view of the rest of Ireland, and my own view is that these schools would be better joined together, because much of the first year's work could be done in common—much of the early years' work could be done in common.

4703. Mr. Justice MADDEN.—The equipment of a practical school for teaching Agriculture would not be nearly so expensive as the equipment of a school for teaching Applied Science and Arts generally?—But a College for higher agricultural instruction would. Equipment for the study of Chemistry, Zoology, Botany, Bacteriology, and for research in these subjects, would have to be provided just the same in connection with Agriculture as in connection with their other industrial applications.

4704. There are splendid buildings in Galway and Cork. It might not be possible to find £80,000 to equip laboratories and provide for appliances for teaching Technical Science generally, but it might be possible to equip one or both of them as a College for the purpose of teaching higher Agriculture—Scientific Agriculture, Applied Science in relation to Agriculture—how does that suggestion commend itself to your mind, I don't want you to commit the Department to any particular proposal?—I have not thought the thing out in the agricultural side at all, but so far as these schools are concerned with the other side of technical instruction, I should think they might be used in a very valuable way.

4705. Most Rev. Dr. HEALY.—As a matter of fact, we were informed yesterday that one of the purposes for which that College of Science was originally instituted was to give scientific agricultural courses, but I find in practice it never did anything of that work, but now it is going to take it up. It appears to me it has a very important work on hand, if it only was developed on the lines of industrial technical instruction as distinguished from agricultural education?—I think a great deal of the work of the first year is common, and the students are taught together.

4706. Mr. Justice MADDEN.—For the work of the first year, which would be in common, you would not require such expensive apparatus?—That is so.

4707. Most Rev. Dr. HEALY.—With regard to the proposal to have the students attending the School of Science taking a University degree, you are aware they can do that at present if they choose?—At the Royal University, because no residence is required.

4708. The Royal University will give its degree to anybody qualified to pass their examinations, but none of them practically come up, I believe?—I don't think many do.

4709. It has been put before the Commission in various ways that there is a general desire to have a new University or Universities—teaching Universities?—Yes.

4710. And the essential element of a teaching University would be a certain amount of control over its constituent Colleges. If your College of Science was to become one of these constituent Colleges, the University would expect to have a certain amount of control, and would not leave it all to the Department?—Do you mean they would control the curriculum?

4711. To some extent, and the appointments to this extent, that if the Department appointed scientific Professors that the University authorities did not consider properly qualified, they would not recognise them, just as they do in London?—You mean as they are doing in London under the new University scheme?

4712. Yes?—The new University has recognised certain teachers.

4713. And if they don't come up to a certain standard they will not recognise them, and no teaching University would allow any University College, any constituent College, to appoint men that in their judgment—the judgment of the University authorities—were not fit to discharge their duties. They want to have some voice, if not in the appointment, at least in the approval of these men. That would be one element in a teaching University?—But that is sufficiently provided in the fact that, if the University is not satisfied with the teaching, it can at any time withdraw its recognition.

4714. Secondly, they would have something to say to the curriculum, and, thirdly, they would require to be represented at the examinations?—As to the examinations that for the degrees would, of course be conducted by the University itself. The College would examine for its own diploma.

4715. These three things are the principal elements that go to make a constituent College of a teaching University. Now, I don't expect you to tell me whether the Department would accept these conditions, but it appears to me it would be necessary to accept these conditions or something like them, if you expect to become a constituent College, and allow your students to go for an intern degree?—These views have been present to my mind in thinking the question over. We do not think it desirable or necessary that the Technical College should be a constituent College in that sense.

4716. Most Rev. Dr. HEALY.—In that sense or something like it, it will be necessary, if the students of the College of Science expect to graduate as intern students of the University, that they must give the University some control over the College?—The University always has the power of withdrawing its recognition; and, beyond that, I don't see what control is necessary.

4717. Mr. Justice MADDEN.—If these students are intern students of the University, they would be immediately under the control of the University. I understood your suggestion—which I did not take as at all binding the Department or as more than expressing your own view—was that an intern student at the teaching University going forward for a degree, such as a degree of Science, might be allowed to avail himself of the teaching of another and an outside body, viz., the Royal College of Science, and that its teaching might be recognised as leading up, to a certain extent, to the degree conferred by the University—is that your suggestion? Was that the idea present to your mind rather than the actual affiliation of the College as a constituent part of the University?—I was not thinking of affiliation; I was thinking rather of something like this: Edinburgh University, for its B.Sc. degree requires seven courses. Four of these courses must be taken out in Edinburgh University, and three of them may be taken out in any College that it approves of. The Royal College of Science, Dublin, is one of these Colleges. The Edinburgh University does not interfere with the Royal College of Science in any way.

4718. Has the University any share in the examinations at the College of Science?—None.

4719. Do they give a degree?—At Edinburgh University they do.

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4720. They don't interfere in the examinations for that degree?—Oh, yes; there is a misunderstanding between your lordship and me in this respect. Edinburgh University examines for the degree, but residence or attendance at classes in Edinburgh is necessary for a degree in Edinburgh. The residence must be at four courses in Edinburgh University, but attendance at the other three courses may be taken out at other Universities or Colleges which have been approved.

4721. Professor LORRAIN SMITH.—They have regard to the Colleges they recognise, and the fees paid, and the fact that the student shows a definite course?—In recognising the College, they have regard to fees paid to see that it was not done at a cheaper rate. That is clearly present to their minds always.

4722. Most Rev. Dr. HEALY.—That is all the interference in that particular course?—Yes. They look at the courses of a certain College when it applies to be recognised in this form, and they say whether they will recognise it or not, and when they recognise it the thing is done.

4723. Dr. STARKIE.—If at any time they cease to be satisfied with the course at the College they would cease to recognise it?—Precisely.

4724. Professor LORRAIN SMITH.—I am not quite clear as to your statement about the circumstances in which there are no industries as a basis for the Department to work on. The point I am not clear about is how they determine regarding the evolution of technical instruction in those places where there are no industries. When you come to a place that has no industries, how do you deal with it?—That is in the Department's report, where it is stated exactly what the Department proposes to do, and its policy in that respect. I tried in dealing with the question to show there were three forms of technical instruction—the day school form, for those who have not yet gone to work; the evening school form for those who have gone to work, and this third form, which might make direct preparation for industry. We have set the two forms at work all over Ireland. The third is a much more difficult phase, but we will have to deal with it.

4725. It would not be accurate to say that the Department would wait till the industry starts before it starts its work in a given centre?—Certainly not. We should certainly start technical instruction in towns where there were no industries. We should not wait until there is an industry.

4726. There has been a clear distinction drawn by Mr. Reynolds between technical institutes and technological institutes—the distinction was new to my mind?—Most experts use terms to their own satisfaction.

4727. His explanation was that a Technical Institute was an institute wherein technical instruction was given as a substitute for the teaching which a master formerly gave his apprentice, and that a Technological Institute was an institute in which was taught, not the working man, but the leader and master of industry, who was taught the principles of Science which underlie the methods applied to trade?—I must say that that difference between technical and technological is quite new to me.

4728. In Manchester it was necessary to have this technological or scientific teaching, and they have it on the University plane, and it is admitted there may be competition between Owens College, which is a University College, and which has a strong engineering department, and the Municipal Technological Institute of Manchester. Which place does your Royal College of Science take in that view?—Our College of Science would be in that position, not so much of Owens College as of the Technological Institute.

4729. What students would you expect to attend the reorganised Royal College of Science?—On the one hand, we expect agricultural students and, on the other, engineering students (both mechanical engineering and electrical engineering) and students who will go into the chemical trades, and so on.

4730. But what type of student would these be?—I think at the present moment both types are represented. The master's son is there. For example, I understand that Sir Howard Grubb's son is at present a student. And, on the other hand, there are those who come up there with the object of finding a living wherever they can in an industry. Both types are in the School, and both types can work together.

4731. In what sense do you consider the College of Science being restricted to given areas?—The College of Science is for Ireland.

4732. Would you intend to draw students from Belfast?—The College of Science is for Ireland, and students from Belfast could come.

4733. Would you bring them from Belfast to Dublin?—They will come if they find the teaching at Dublin is better than at Belfast.

4734. Would it not seem more natural you should develop the Technological, as well as the Technical, School, at Belfast?—That is the view of the Belfast Technical School Committee. The idea is the same, no matter what terms you use. There are the two types. The master's son, on the one hand, probably goes through his Primary and Secondary Education, and finishes in a Technical College, as at the Manchester Technological College. On the other hand, workmen go to the evening classes, mainly; and we have the third class—neither masters' sons nor workmen, but those men who mean to get a living wherever they can, and look to industries. These go through the day course in the College of Science.

4735. You said Belfast Technical School would include both masters and men?—I think it is the intention; but it has not been developed far yet.

4736. If that be the intention you would not draw any students from Belfast?—I would like to say this about Belfast: so far as the day school is concerned the question really has not been threshed out. It is only the evening school that has, up to the present, been dealt with.

4737. It is a problem we have to deal with in this Commission. It seems that to have an evening school and a Technological School that you would want two different staffs of men?—I don't agree with that.

4738. I don't think it possible for a human being to teach day and night?—It is not only possible, but it is done, and well done, in many institutions. Take, for example, one I am acquainted with—the Heriot-Watt College, Edinburgh—where they have three gentlemen of professorial standing to teach in day and evening courses.

4739. How long in the week—how many hours a day?—From sixteen to twenty hours in the week.

4740. And they do research work?—There is not much research done.

4741. That is the result, speaking without any direct experience of the management of such schools. But the point put before us this morning, in regard to Manchester Technological School, was the supreme importance of research?—Yes.

4742. I should say there may be human beings able to teach day and night. I should not like to have the office myself; but I don't see how, possibly, you can have research carried out. It has been put before us by Mr. Gill that research is one of the primary aims of your Department?—It is; the research method, moreover, is one which, I think, should be employed in education from the Kindergarten to the University.

4743. What I want to get at is this: if we are to develop what I call the technological branch of education you have to separate it practically from the technical in the sense of teaching the workmen?—You mean you have to separate the day teaching?

4744. A different staff, otherwise your research will go to the wall?—The question has usually arisen in the Technological School in this way: Here is an evening staff; what will we do with them in the daytime? That has been the puzzle. A day course was organised, mainly for the purpose of giving the teachers work to do in the day time. As for doing research it would be an excellent thing to have them at it, but you can consider what a town committee would say to funds.

4745. I don't think you will find any body of men who will more appreciate the value of research, once they see the fruits of it. That has been my experience?—I quite realise, and take that view, that it should be the prime aim in all these institutions.

4745A. I don't think the organisation you are sketching could do it with men teaching day and night?—It is possible. Give plenty of assistants, and there is no difficulty.

4746. Starting primarily you cannot get a man to work day and night, and have sufficient energy left for research?—If you have any teaching you must have laboratories under the control of one Professor.

4747. Control is a wide word. In Manchester they import a different staff for the evening teaching?—But suppose it were Mechanical Engineering that was being taught, they could not run the engines at night without the knowledge of the head of the department who runs them in the day time. You would have a supreme head of the Mechanical Engineering section. He need not be present in the evening. He might come in, or not, if he likes; but he must control the teaching.

4748. He must control his institute?—His section. I think it is possible to have both within one school.

If a new school were being started, the question is an important one; one would not make it, unless the number and character of available students demanded it.

4749. Make what?—These two forms of instruction in the one building, unless the students of the town demanded it.

4750. There is the alternative, in Belfast, of developing the technological side of the Queen's College for the day school. The technological sides are being developed in the Universities of Germany?—I have not first-hand experience of Germany.

4751. That is the tendency of educational opinion in Germany?—We have plenty of examples in England and Scotland, and Technical Schools are being more highly prized every day for this very class of work.

4752. Which class?—This day instruction of a higher type.

4753. What is happening in Manchester is, that the Technical School is of such a high type that it will seriously compete with the University College. They will be neutralising each other, which is an extremely undesirable state of things, and one we should avoid?—Yes. I think you would avoid it in Dublin by adopting the College of Science courses in the form I suggested, if you construct a University in Dublin.

4754. Would the College of Science adopt the course in Pure Science which the University adopts?—Do you mean would the College of Science cease to teach Pure Science, and teach only Applied Science? It is not possible to teach Applied Science without a basis of Pure Science.

4755. Mr. Justice MADDEN.—You may have students outside the University who are not taking degrees?—Yes.

4756. Professor LORRAIN SMITH.—Are you going to compete with a Professor in the University College in the same area?—I should say no. The Professor in the College of Science will be, for example, a Professor of Applied Chemistry.

4757. But he is teaching Pure Chemistry?—He must. His main object is, however, to teach Applied Chemistry.

4758. Do you see any difficulty there?—I really cannot. You cannot teach Engineering without teaching Physics.

4759. Would you have a teacher of Physics competing with a teacher of Physics in the University?—No. Supposing there were a Professor of Mechanical Engineering in the Technical School, his teaching of Physics in relation to Engineering would be confined chiefly to Heat; whereas if he were a Professor of Electrical Engineering he would confine himself mainly to Magnetism and Electricity. In the University College they would take up a course of General Physics—Sound, Light, Heat, Electricity, and Magnetism.

4760. Would you expect an Engineering student to have all these subjects in the elementary course?—It would be a very elementary course.

4761. The course of the first year has been fixed, at the University?—I doubt that. The time at his disposal does not permit him to take it so widely.

4762. In Chemistry you would have an ordinary course. Before the student went to Applied Chemistry he must know the work one gets to know in the first year of the College?—In Chemistry it is plainer than in Physics.

4763. Take Chemistry. You have two men aiming at the same things, competing with each other; one with all the resources of the Department behind him, while the other would be struggling to make ends meet, as happens in University Colleges?—I think not. The two men have quite different aims, and it would be an entirely different course.

4764. It is possible; but it would not naturally happen, and up to a certain point the Medical student, the Technical student, and the Agricultural student, are all the same?—Not so.

4765. They require a certain rudimentary knowledge of Chemistry?—In a Medical course a man giving instruction in Chemistry would surely take up Prussic Acid; but a general chemist will not take up that unless he is taking a large course in Chemistry, and an Engineer would never touch it.

4766. It is in all Practical Chemistry courses?—No; in only Medical Courses. Again, if you go far into Organic Chemistry the engineer will not follow you.

4767. You see no reason to fear competition?—No, provided you make the one a School of Applied, and the other a School of Pure Science. Keep these objects in view, and I don't think there is any competition to fear.

4768. Dr. STARKIE.—In one part of your evidence you compare the authorities administering grants in Scotland with those in England, and you pointed out that they have not yet arrived at unification in England, although they are aiming at it. I should be glad that you would point out more clearly the advantages of having one authority administering all the grants in Scotland—you believe it a superior system?—I do.

4769. How are the various systems co-ordinated in Scotland?—For example, the one head of the Scotch Education Department will, in the course of a day, deal with Primary, Secondary, and Evening Continuation Schools, Science and Art Schools, and Technical Schools. In dealing with the subject as a whole he can have a much clearer idea of the relative proportions of the work than he could otherwise have—than he would have if it was administered as it has been up to the present, in England, by the Elementary Education Department and the Science and Art Department.

4770. He can provide a curriculum in Science in Primary Schools as adapted to the training of boys who enter Technical Schools and Secondary Schools?—Yes.

4771. That is the great advantage?—Yes.

4772. Tell us more clearly how the funds are distributed and spent on the schools. The head of the Education Department can take measures that an undue proportion of these funds is not expended on one particular department?—Yes.

4773. Coming to Ireland—you pointed out that in Ireland the education has been administered, up to the present, in water-tight compartments. There is a Board of National Education, an Intermediate Board, and the new Department. What are the disadvantages you have experienced up to the present from the want of co-ordination between these Departments?—I don't know that I am quite prepared to answer that question. We have had a great deal of connection with the Intermediate Board, and there has been a closer connection than even took place in England or Scotland. The Intermediate Board and ourselves have agreed on a programme, and that is being worked in Intermediate Schools by the Department. Now, such a thing, I don't think, has any precedent in England—certainly no precedent in Scotland—but it is a most excellent thing.

4774. Your meaning is that, although technically the Boards have not been united in Ireland, still there has been an understanding between them which has shown the advantages of uniformity so far?—So far.

4775. But the disadvantage is that it is only a private arrangement. The uniformity is due to a private arrangement between these Boards, which the Commissioners next year might see reason to overthrow?—That might be, but it does not seem at all likely.

4776. In your opinion the proper aim for educational authorities in England and Ireland would be to establish such a system of administration as they have in Scotland, viz., one authority administering all the grants?—My personal experience in England and Scotland has been in favour of that view. In Ireland, things are different. As I have just said, our experience has so far been promising for co-ordination.

4777. Administering all grants given to education below the University standard?—Yes.

4778. Mr. Justice MADDEN.—How is that authority constituted, in Scotland. Dr. Starkie has reminded you there are two Boards in Ireland—the National Board and the Intermediate Board. I have the privilege of knowing the eminent head of the Scotch Department—Sir Henry Craik. He is the Secretary?—The Permanent Secretary.

4779. Has he a Consultative Committee, or is he an autocrat, subject to the control of Parliament?—Yes; using autocrat in the best sense.

4780. Benevolent despot, perhaps, I should say?—Yes.

4781. There is no Board—no Consultative Committee—in Scotland?—No.

4782. Therefore, he is responsible for the entire management of the educational system?—To a Minister of the Crown.

4783. The Ministers of the Crown are responsible to Parliament. There is usually one in the House of Lords, and one in the House of Commons, and the money voted is at the disposal of Sir Henry Craik, under the immediate control of Parliament?—Yes.

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4784. The money administered in Ireland, so far as it is applicable to Primary Education, is money voted by Parliament?—Yes.

4785. The Minister for Ireland, who is the Chief Secretary, is responsible in the House of Commons for the administration of that fund?—Yes; he is the Lord Balfour, so to speak.

4786. The money administered for the purposes of Secondary Education in Ireland is not money voted by Parliament. It is a statutory endowment, out of the control of Parliament. I think you may answer that question in the affirmative?—Yes.

4787. It consists partly of a million of money transferred from the Irish Church Fund, and partly of a surplus of Excise money, popularly known as "whiskey" money, corresponding to the grant you have mentioned for England. That is a statutory provision, outside the control of Parliament?—But it was handed over by Parliament.

4788. Yes, under an Act of Parliament, and nothing can take it away but an Act of Parliament?—They raise money under the Scotch Department in addition to the money voted by Parliament.

4789. Dr. STARKIE.—You spoke of Sir Henry Craik being an autocrat in the best sense; but has he not a Committee of Education?—There is a Committee of Council of Education in Scotland. Sir Henry Craik, in Scotland, is equivalent to Sir George Kekewich in England. They are both responsible to a Minister. I was not working in the office of the Scotch Education Department, and I don't know whether there is any interference with them, but I think interference is exceedingly small.

4790. Professor DICKEY.—You said the grant for the county boroughs amounted to £25,000?—Yes.

4791. And of that sum Belfast gets £10,000 and Dublin £10,000?—Yes.

4792. That leaves £5,000 for the remaining four?—Yes.

4793. Which is given according to the population?—The division *inter se* is in proportion to population.

4794. What is the grant to Derry?—I could not tell you that. It is somewhere about £1,200.

4795. And about the same to Cork?—Cork is much bigger than Derry. Cork gets £2,730. Cork is twice the size of Derry.

4796. Limerick and Waterford get about the same as Derry?—Yes.

4797. Last year the Corporation in Derry, or the County Council, devoted a large sum to equipping the local schools with laboratories for teaching Science?—No. They did in Belfast. In Belfast they gave £1,900 to equip local Secondary Schools with laboratories, and Cork and Waterford also devoted a sum to this purpose, but Derry did nothing last year. They made certain proposals this year on that question, which are not finally settled.

4798. Was there some difficulty?—In what respects?

4799. With regard to giving a grant to certain schools—ladies' schools?—That matter is under consideration, and I cannot go into it here.

4800. In Cork a sum of £1,500 was given to a Christian Brothers' School there?—Not by the Department, but by the local authority, with the approval of the Department.

4801. £1,500 was given to a Christian Brothers' School?—One had £1,400. The Cork Corporation gave £700 the first year and £700 this second year.

4802. For equipment?—Yes.

4802A. That will not be a permanent grant?—It is an equipment grant.

4803. Is there any other centre in Ireland that is receiving from the Department, directly or indirectly, grants of that kind?—No.

4804. Now, as to Secondary Schools?—The Royal Academical Institution, in Belfast, got £400; the Methodist College, £400; St. Malachy's College, £400; Royal Academy, £300; and the Christian Brothers' Schools, £400.

4805. On what principle are these grants made to the schools?—By the Corporations, or by the Technical Instruction Committees.

4806. I understand the Department has to sanction these arrangements and, I presume, the Department lays down conditions on which the grants are made?—We have regard to what they are going to do with it.

Mr. Justice MADDEN.—Does this question point to the relations between the Department and Secondary Schools?

Professor DICKEY.—Yes.

Mr. Justice MADDEN.—We cannot go into that. If the questions are with regard to an equipment for teaching Science, which would lead up to the University, then they are admissible. The relations between the Department and Secondary Schools are outside our reference. Any question relating to arrangement made for bringing pupils from the schools to the University is admissible.

4807. Professor DICKEY.—Do you intend offering Scholarships to pupils of Secondary Schools, leading up to the University?—The Department will encourage local authorities to do that sort of thing. We may stimulate the local authority. It is the local authority that takes the initiative.

4808. You are an advising body?—Yes.

4809. And, practically, you initiate?—It comes to that in a good many cases.

4810. Do you propose to provide Scholarships for Primary Schools in the same way, to lead the boys to the Secondary Schools?—In some county schemes arrangements have been made for a Scholarship from the Primary to the Secondary Schools. If a county suggested to have Scholarships from Secondary Schools to the Royal College of Science, or the higher Technical School, such a thing would be approved.

4811. Referring to the Technical School to be created in Belfast, and the relation of it to the Queen's College, would it not be possible, supposing Belfast were created a University centre, to have the school brought into direct relation to the University—more direct relation than is possible at present?—Do I quite understand your question? You say, supposing a University were formed—do you mean a University leaving the Queen's College as it stands?

4812. No?—You want to know would it be better to have a Technical Institute attached or affiliated to the University in Belfast, than to leave it in the Technical Institute?

4813. Would it be easier to do that than to affiliate it with the Queen's College, under the Royal University?—That view of things did not occur to me, and I have not thought it out. I don't think there would seem to be any difficulty.

4814. Belfast has one constituent College in the Royal University, and a Technical School might be in competition with it in the Royal University, whereas in a Belfast University the Queen's College and the Technical School could be co-ordinated?—If you allowed a course at the Technical Institute to count for the new University under present conditions, any student could attend and take out his course.

4815. Then, in that case, the school would be competing with the Queen's College in the Royal University?—You have got large Secondary Schools competing with the Queen's College at present.

4816. And grinding establishments?—Yes.

4817. Professor LORRAIN SMITH.—That is the difficulty that adds to the competition against the Queen's College. There is an enormous sum given to Belfast Technical Institute, which may compete with Queen's College, which has only £10,000 a year?—I would like to say a word on that. If Belfast has its proper quota of evening students (the population is 360,000—you may say one in fifty of the population should be in the evening schools) that will be 7,000. They will cost, roughly, £21,000 to teach. The cost of an evening technical student is, as nearly as possible, £2 15*s.* per head; so if they had their proper number of students in the evening schools it would cost £21,000, and they have £10,000 from the Department. There is no enormous sum there.

4818. Professor DICKEY.—You expect the Technical School in Belfast to be a great success?—Surely.

4819. Though the Department only gives £10,000, yet the Belfast people will contribute a very big sum, and have a very big school?—Yes, undoubtedly.

4820. It may compete seriously with the Queen's College, Belfast?—Its aims will be different, surely. That is the whole thing. The aim of this Belfast Technical Institute, assuming it is a day Technical School, will be to make engineers and men of that type; but the Queen's College does not aim at doing that.

4821. I am looking at the other side of the question. If you had a University in Belfast, that school would fall into its place in the University. In other words, you mean that the Technical Institute or school would stand in the same relation to the University as the Royal College of Science would stand to the University here?—Extra-mural classes you could recognise.

4822. Exactly?—That would be the thing to do with it if it was developed. It is not now developed, and I would not like to go into the future.

4823. Speaking of evening classes, would it be possible to have them conducted economically, by having advanced students of Queen's College, senior scholars, in Science, for example, constituted teachers?—It might be very good practice for the advanced scholars, but very bad instruction for the elementary scholars taught by them. You cannot have too good teachers in the school. If you try the arrangement you suggest with the artisan apprentice he will stop away, and quite rightly, too.

4824. With its equipment of Professors and scholars, holders of Studentships and Fellows, you would have a teaching power at hand at the University which you might utilise economically for a school of that kind?—My experience up to the present is, that there is too much aloofness in the academic atmosphere to permit of that being well done. Somehow or another, as they get in the University Colleges, and so on, they all get what you call the academic atmosphere round them, and they all failed to realise the applications of Science.

4825. The Liverpool College, you understand, met the situation. They have a Technological Department and Chemistry in the College?—Yes.

4826. And it probably will become a University in the course of time?—Yes.

4827. That University will have a Technological School?—Yes.

4828. And probably absorb the Technical School about to be created there?—It may.

4829. And the situation in Belfast would be somewhat similar, would it not, to Liverpool?—I feel that these institutions, according as they come within the limits of the University, lose their character of teaching the application of Science to industry, and become mere Pure Science Schools, whereas the intention is to develop them the other way.

4830. Mr. Justice MADDEN.—Your idea is that they may be utilised by, but not absorbed in, the University?—Yes; not to become a constituent part of the University.

4831. Professor LORRAIN SMITH.—What do you say to the Engineering department of Cambridge?—I have not been in the Engineering laboratory of Cambridge.

4832. Men there pass immediately into the works straight from the laboratory?—That is true; and there have been Professors who came from the laboratories in Cambridge straight to University College. But I think these men would have been a great deal better if they had a couple of years in workshops before they had gone to the University.

4833. That may be; but the fact remains that academical institutions are producing practical engineers. You said Technological Institutions do that, and that Academic Institutions do not?—What I said was this: that Academic Institutions are doing this in some places; but that is not their aim. The aim of a Technical School is to do it. My experience has been that so far as Technical Schools have been absorbed or taken in by the University they tend to go the other way—to go towards Pure Science rather than to their own proper aim—of Applied Science. There is one remark I would like to make, which escaped my attention at the time. It is a question of my own experience. I took an Arts degree in Edinburgh, and I was debarred by the question of residence from taking any other degree in Edinburgh, and I had to take my Science degree in London. It has always struck me it would have been the right thing for Edinburgh University, assuming I paid the fees, and so on, to have admitted me to a further degree without residence. Once a man has taken a University degree he should be admitted to all other University degrees without residence, provided he passes the examinations.

4834. Would you have residence for the first degree?—Yes.

4835. Professor DICKEY.—What further residence would be required for the B.Sc. degree?—I do not know; but attendance at a certain number of classes in Edinburgh would have been necessary.

The Witness withdrew.

W. MAYHOWE HELLER, Esq., B.SC., Head Organiser for Science Instruction under the Board of National Education in Ireland, examined.

4836. Dr. STARKIE.—Mr. Heller, you are a B.Sc., London?—Yes.

4837. And an Associate of the City and Guilds of London Institute?—Yes.

4838. Before you were appointed by the National Board Head Organiser of Science Instruction you had considerable experience in organising Science instruction in London?—Yes; I was about 3½ years in charge of one-third of the London Board Schools, in which position I was responsible, both for establishing the scheme of instruction, and the training of the teachers concerned in those schools, and in the schools generally in London.

4839. Was that the training of teachers?—Yes; the training of teachers of schools. They came to my headquarters for evening instruction. Their attendance there was entirely voluntary, they had no recognition of attendance; but the Board, having realised the importance of the work, placed the fact that they had been pronounced competent in this particular kind of work on the record of the teacher, and it counted towards his promotion in the service.

4840. After leaving London you held an important position in Birmingham?—I was appointed head of the day department of the Muncipal Technical School in Birmingham. My chief functions there were relating to what is called day Technical School work under the Scheme of the School of Science, of the Science and Art Department. I held that position for three years, until the time I was appointed under the National Board.

4841. With regard to the Summary of Evidence you have put in, I suppose you understand that University Education alone falls within the scope of the present inquiry?—Yes.

4842. But still, the Commissioners do not consider themselves precluded from taking evidence on Primary and Secondary and Technical Education, so far as it leads up to University Education; and, consequently, I would ask you, in treating of the work done in the National Schools, to keep that point in view. I would ask you to develop the first portion of the Summary of your evidence in your own way?—Beginning with the position of Science in the past in National Schools? As far as I am able to judge from the evidence I have seen since I came over here—the practical position was, when I came over here, that Science teaching in National Schools was almost non-existent. There had been, apparently, a considerable amount in the past, more particularly in connection with the Model Schools; but owing to the changes in the regulations of the Science and Art Department nearly all this teaching had, during the last fifteen years, become extinct—mainly due to the fact that the regulations of the Department were considerably altered, and that a decision had been arrived at, that the work should reach a higher standard than that reached in the Primary Schools of the country. The instruction that was given in the National Schools was, I think, almost wholly undertaken more as a financial speculation than anything else.

4843. That is because there were certain results fees?—Because there were certain results fees. They received certificates from the Science and Art Department, and I think, in the main, in a large number of cases certainly, the teachers organised classes simply and solely as a means of addition to their income. In very few of the cases was Science taught, because there was a demand for scientific instruction itself.

4844. It has been the experience of a few Technical Schools in existence in Ireland that, on account of the dearth of scientific instruction in the Primary Schools there was no material?—There was no material.

4845. And their time was taken up in imparting the beginning of scientific instruction, which should have been laid before?—That is the case. Practically there has been no foundation laid for the work of the Technical Schools of the country, and it was our experience in England, certainly for five or six years, that practically the whole of the technical instruction provided for, was almost wasted for that reason, and to a large extent it is at present outside the main centres of population, where there are large School Boards, or a systematic Science instruction in the Primary Schools.

4846. Please state shortly what the National Board

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have attempted to do, within the last couple of years, in the direction of encouraging Science in National Schools?—In the first place, in the new programme the subject of Science has been introduced as one of the compulsory subjects of instruction. That I believe to be a move which has not yet been made by the Departments governing Primary Education, in either England or Scotland. The wording of the Board's programme with regard to that is, that amongst other subjects "Object Lessons or Elementary Science are compulsory in schools in which there are teachers holding certificates of competency to give instruction in them, and that these branches must be introduced into all schools as soon as possible." In view of the fact that there were few teachers in the country who really had any scientific qualifications, and also the fact that those who possessed these qualifications were trained in a manner not conducive, perhaps, to produce the best sort of Science teaching in the Primary School, the Board appointed myself as head organiser to arrange, not only a scheme of instruction, but classes throughout the country for the training of the teachers in this particular subject. The purpose of the teaching should be stated. It is indicated very fully in the original programme, issued in 1900 by the Board, and, further, in the circular issued to teachers within the last few weeks. To summarise the purpose of that instruction, I might say it was intended, in the first place, to give an example of the scientific method of inquiry, to teach a child how to learn to become self-reliant in his work, to cultivate accurate observation in the widest sense, including not only accuracy of observation, but accuracy of manipulation of thought and reason, and accuracy of verbal expression; and further, generally to form a habit of careful, thoughtful, conscientious work; and finally, to lay the foundation of habit and education, on which could be built any form of higher or technical instruction. Those are the main purposes that the Commissioners had in view in introducing Elementary Science to an important place in their programme.

4847. The idea of the Commissioners was that the method you speak of is a method not solely applicable to Science, but also adapted to the study of any other subject?—Exactly. And I must say I feel strongly, myself, that the improvement of method to a large extent will have to depend on the examples of the methods given in this instruction. The kind of instruction to be given is left, to some extent, to the teacher. In the programme itself four courses of instruction are suggested. The four schemes are—First, one of general Elementary Science, which is fundamental to the further study of any specific branch of Science and other schemes, on more specific subjects—Heat, Electricity, and so on—but the teacher has, at the same time, power to devise any scheme of instruction for himself, which he may submit for the approval of the Commissioners through the inspector, presumably. And where systematic Science instruction is not given, in the smaller centres, particularly in country schools, the school devotes itself largely to Object-Lesson teaching of a scientific character.

4848. You point out in your Summary that the programme suggested by the Commissioners of National Schools was drawn up on the same lines as that issued by the Technical Department, and that this would point perhaps to some future co-ordination of the Primary Schools with the Secondary?—The schemes are, in the main, almost the same, the difference being, of course, that in the programme for the Intermediate Schools the work is carried further and more fully than we would attempt in the Primary Schools. The underlying principle of the work, and to a large extent the ground covered by our scheme, are almost the same.

4849. It would seem, consequently, to have been the intention and aim of the Commissioners that a ladder should be provided, leading from the Primary Schools to the Secondary Schools, and thereby to the Universities—I suppose that was the idea of the Intermediate Board and of the National Board in promulgating these programmes on the same lines?—Presumably, though I think it is almost essential that wherever Science instruction is commenced, it must practically be commenced at the same point, and more or less on the same lines. It does not seem to be a wide field to choose from at the commencement, because there are certain very important parts of the subject, which are fundamental to everything that comes afterwards.

4850. Is there any prospect of a pretty large number of the pupils in Primary Schools being induced to enter Secondary Schools, and thereby to rise to University Education?—It can only be in towns of fair size, where Intermediate Schools exist. There might be, as, I think, in other districts, a considerable number passing from National Schools to Intermediate Schools, and they would most probably pass in between the ages of twelve and thirteen.

4851. In a poor country like Ireland, would there be a prospect of that unless the Intermediate Board offered Bursaries to the best boys in the National Schools, which would carry their education at some of the recognised Secondary Schools in the country?—Our experience in England was that such Scholarships or Bursaries were very largely instrumental in moving the best pupils from Primary Schools to Intermediate Schools.

4852. We have evidence from Manchester that it is an exceptional thing for a pupil to leave the Primary and to go to the Secondary without a Scholarship?—That would not be my experience. My own school, in Birmingham, was a Secondary School, and I would receive for the year about fifteen Scholarship pupils, and probably thirty to forty other pupils from the Primary Schools of the town.

4853. Did you offer Bursaries?—Yes, from twelve to fifteen each year.

4854. To boys of fourteen years of age?—Thirteen and a-half.

4855. Did they enter your school as early as that?—Yes.

4856. How long do they remain?—Till seventeen or eighteen.

4857. Most Rev. Dr. HEALY.—What value were the Bursaries?—According to the year. The first year's was £5, second £5, third £10, and fourth year £15.

4858. Dr. STARKIE.—Was it your experience of these boys that entered with Bursaries that they continued their education beyond your College—did they go to Mason College, Birmingham?—Remarkably few. At the time I was connected with the school the University had not opened. Now that it has started, they are going from the Technical School to the University, but during the three years I was head-master of that school there was only one boy who left my school and went to the University, and he was the Registrar's son.

4859. Do you think they would be more likely to go to an institution like the College of Science, devoted to Applied Science, than to Arts Classes, and take up Pure Science in the University College?—It would be in that direction—that a boy, educated in that kind of a school, would undoubtedly prefer to go to the University of Birmingham, which assumes, more or less, the functions of the Royal College of Science, in that it has its Science instruction of a technical character. A considerable number will leave that school and pass on to the University, but, in the main, when they leave the school, they enter into the works and industries of the town.

4860. With regard to the work of the Training Colleges, I suppose that the dearth of scientific training in the National Schools has been more felt among the King's Scholars entering the Colleges than in any other department?—We have to start in the Training Colleges in the same way as we start in the schools, and the success of the Training Colleges in the first year—it was not a full year's work—must be considered as something remarkable, and I was more than satisfied with the work accomplished during the first portion of the year's work.

4861. Do you think the scientific work given in the Training College would be of such a type that it could be recognised by a University in Dublin, we will say?—I don't quite understand in what form.

4862. We have heard that lectures at extra-mural schools are recognised in Edinburgh?—I don't think that the training in Science, given in the two years in one of the Irish Training Colleges, could ever hope to be of such a standard as to qualify for a degree.

4863. Do you think it desirable that, supposing the Treasury allowed us to extend the course of training to three years, that it would be possible for a scholar attending a Training College to qualify for a University degree, taken in connection with certain Arts work?—If we can assume that, in the course of some years, a King's Scholar, entering the Training College, has received the full training, we expect the scholars to receive in the National School, then with a training course of three years, such a standard might be reached. I don't think we can hope, in the near future, that pupils in National Schools can get very far in specific Science subjects.

4864. Would you be in favour of this suggestion,

that the monitors in National Schools, who remain in Primary Schools for five years after passing the Sixth Standard should be encouraged to pass through the Secondary Schools, and get a good Secondary Education, and then take a year in Arts in the University during their time in the Training College?—It would be most desirable. It would be a good thing to give the teachers of Primary Schools some such training. It would be of immense advantage if National School teachers could see something more than the routine of their own Primary Schools, and be encouraged to go to Secondary Schools by Bursaries. It would be an enormous improvement.

4865. Would it be feasible?—That is not an easy question to answer.

4866. What we are anxious to do is to have a nucleus of really well-equipped teachers, which we have not got at present?—It would be eminently desirable, to enable the students who were to become teachers, to pass through the Intermediate Schools, and see the methods by which the Intermediate School is worked.

4867. To get a liberal education in Arts before they enter the Training College at all?—Yes. The great thing one misses in the Primary teacher in England is the fact that they don't realise the public school life of schools, which might be developed equally in a Primary School as in a Secondary School. It is merely the dry bones of instruction they offer, and such a school life is considered of no importance whatever.

4868. And, consequently, that is a policy you would urge on the Intermediate Board—to offer inducements to the monitors of National Schools to complete their education in the Secondary Schools?—Certainly.

4869. In addition to Science instruction, day Technical Schools should be established in Ireland?—Yes. I think the School of Science of the Science and Art Department is a very important class of school, particularly in the main centres. I am rather sorry to say that the only two schools of that character working in Ireland have practically been abolished, in that they accepted the diluted form of a School of Science proposed by the Department of Agriculture, and which is being practically and universally adopted by the Intermediate Schools. At present about four hours' instruction in Science is all that is actually admitted.

4870. In what schools?—Intermediate Schools. There were two Schools of Science originally in Cork, and in these they had to spend considerably more time at modern subjects than under the new scheme.

4871. How would this day Technical School develop from those established at present by County Boroughs?—They would be schools for boys between twelve and eighteen, and the curriculum would be wholly modern. No time from the age of twelve would be devoted to Classics.

4872. The Department have been establishing, or indirectly establishing, schools in various parts of Ireland—Technical Schools?—Those that I know are providing evening instruction only.

4873. You would be in favour of day instruction?—Yes, of this type, for boys, who might enter the school at twelve or thirteen. It should be very much more strongly on the modern side than any of the schools working at present.

4874. You know that the Intermediate Board have been trying for the last year to establish a modern side and schools of a modern type—do you think they might fulfil the function you desire by building up the day Technical Schools?—For two reasons, I don't think they ever will. In the first place, I don't think they are prepared to devote anything like the time that is necessary to the practical side of education; half the school-week should be devoted to the practical work of workshops, laboratory, and drawing office, and the other half to work in the class-room. In the next place they would have to submit to the examinations each year, which would be very largely destructive of the best work of such a school. The School of Science in England owes its remarkable success to the fact that it was almost entirely exempt from examination, and subject to inspection only.

4875. You know the Intermediate Board have in contemplation a very extended system of inspection which, perhaps, may gradually take the place of the examination?—Yes.

4876. Mr. Justice MADDEN.—Your idea may be carried out in this way:—for that portion of the curriculum in the Intermediate School the test should be a test by inspection, leaving examination as a test for the classical side—is that your idea?—The school is one that should devote itself to the requirements for modern education entirely.

4877. Suppose there were a single school of an Intermediate character, which developed a modern side such as would meet with your views—would it be possible to combine the two systems, so as to have the efficiency of the school tested on the modern side by an inspection, and on the Grammar side by an examination?—Yes, where you have that side. That is the type of practically the majority of the Intermediate Schools, that have a Grammar School side as well as a modern side.

4878. Do you look forward to the possibility of having that division in Dublin or Belfast, or in smaller towns?—Not in smaller towns, but in the three centres of Dublin, Belfast, and Cork. It is the specialised type of school I am thinking of.

4879. Dr. STARKIE.—Coming to the Higher Technical College in which you desire technical instruction of a University type should be given, perhaps you would develop your views shortly?—The Higher Technical College, as I understand it, would be, in many ways, very similar to the day Technical School, to which I have referred, and which would really comprise both the functions of the Royal College of Science in London and also the Central Technical College. The curriculum would be somewhat different to the ordinary University curriculum in that greater attention would be paid to the practical side of education, and that also one should insist in the curriculum on a general all-round training in the first two years; that the student would not be allowed to specialise so early as he does mostly in the University course or in a College, more particularly like the Royal College of Science. In the Central Technical College of London, which is more particularly the kind of College I suggest the student in his first two years must go through a compulsory course in all subjects taught in the College—Mathematics, Chemistry, Physics, Engineering, including Drawing and two modern languages. It is practically a compulsory course he cannot escape. It is absolutely the same for all students, in the first year. In the second year all subjects bearing on his own particular subject, and the third year practically is confined to his own particular subject and research in this subject.

4880. Supposing that the new College of Science were reconstituted in such a way that its lectures in Applied Science should be recognised by Trinity College, and if it were decided to set up a new College, a University in Dublin would be unnecessary to duplicate the general course of the first two years in the Technical College and in the University—would it be sufficient if the students attended instruction in the University College for two years on general subjects, and then went to the Technical College or College of Science?—The main virtue of a College such as I suggest here is the fact that the student must go through a general course and is practically under supervision the whole time. At the College of which I am speaking practically every piece of work formed by the student, not only in his examination, but in the daily work of the College, was recorded and all taken into account in determining his diploma at the end of the course.

4880A. A diploma or a degree?—A diploma only. He had not the freedom the average University student gets when he goes to a University, that is to say, the jump from public school life is not so great as it usually is when he leaves a school and goes to a University.

4881. You think that jump is so undesirable that you would not approve of allowing future attendance at the College of Science to cut short the first two years at the University. You say students going into the University would pass from the discipline of the school to the comparative indiscipline of the University, and that that is undesirable compared with the system in the Technical College?—Yes. Practically, in a College like that we had hardly any of the type of student we call "wasters." Practically every student at the end of his career was a more or less useful engineer.

4882. It was pointed out that students taking out a technical course in the College of Science would desire a University degree, in which case, of course, they would have to attend part of the University course—did you find in London there was any such desire?—There was considerable desire on the part of students at first, but it was forbidden by the professorial staff. When a student expressed a desire to read for a University degree he was told it would endanger his diploma if he did so, and no student had time to read for a University degree.

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4883. Mr. Justice MADDEN.—What was the motive—to what do you attribute that rather curious mandate?—To the fact that the work of the College in itself required the whole attention of the student who was there, and if he were to attempt to read for a University degree, a good many outside subjects more or less useless to him in the profession he was going into, would be introduced, and the Professors considered that it would seriously endanger the work he was doing.

4884. Did the Professors consider general education useless to a professional life?—It was not general education they objected to, but they held the student was there for a specific purpose.

4885. Dr. STARKIE.—Their objection was due to the evils of the old University of London system?—To a large extent it was.

4886. You are referring to the examination system?—Yes.

4887. In order to get rid of this evil you propose that in the case of students unable to attend University lectures during the daytime there should be evening lectures?—I think the evening student in the past has been much neglected. There is a large body of extremely able men and women who would take advantage of really sound instruction in the evenings, and the instruction which has been given very often for such students who are intending to read for a degree has been of the worst possible kind, and if such students could attend lectures of a University type, and where practical work is done, if they could go through laboratories and receive first rate instruction, and that the record of a student during such instruction might count, it would be a very important factor.

4888. Would a couple of hours in the evening be sufficient to qualify an evening student for a University degree?—Three hours might, probably.

4889. I put the same question to Mr. Reynolds this morning, and his experience was that the students attending the evening classes were not of the same type as those of the day classes, and he did not seem to be much in favour of giving University degrees to evening-class students?—There are among the evening students a great many very earnest and very good men. That is my experience. Very often we had in the Technical School of Birmingham men who had been through every laboratory in that School, and they attended three or four nights a week for five years. They were qualified men, but had not the means of obtaining the hall-mark of a degree.

4890. What is the relation of this Municipal School in Birmingham to the University?—There is no very direct connection between the two at present. The University is in such an early stage that there had not been time to arrange these matters. The main points concerning the University and the Technical School are that the Technical School Council have given to the University funds £5,000 a year from the funds of the Technical School, and at the same time the undertaking is that the University shall not undertake any evening work, and that the Technical School shall not undertake any day work for adults. The Technical School Committee have given a guarantee that the development of the Technical School itself shall not be allowed to suffer from its contribution of £5,000 to the University funds.

4891. Professor LORRAIN SMITH.—You spoke of a third year for research. How is that carried out?—In each department a student is at the beginning of the third year introduced to some bit of research.

4892. How many students can a Professor take in such a course?—As a rule, in the third year in each department there would be twelve or fourteen students.

4893. Had he each one at a separate research or a group?—They might each be dealing with different phases of the same research. Sometimes there would be three or four different researches. In an electrical laboratory there would be four or five different lines of research, and in the mechanical laboratory in the same way.

4894. Did you find it of immense educational value?—Yes; I look back on it as the most important part of my own training.

The Witness withdrew.

The Commission adjourned until the following morning.

TWELFTH DAY.

THURSDAY, NOVEMBER 28TH, 1901,

DUBLIN.
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AT 10.30 O'CLOCK, A.M.,

At the Royal University of Ireland, Earlsfort-terrace, Dublin.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT. D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.; and Mr. J. D. DALY, M.A., Secretary.

ALFRED WILLIAM BEVIS, ESQ., wh., sch., M.I.M.E., Head Organiser for Drawing and Hand-and-Eye Training under the Board of National Education in Ireland, examined.

Alfred Wm. Bevis, Esq., wh. sch., M.I.M.E.

4895. Dr. STARKIE.—I believe you are a Whitworth Scholar and a Member of the Institute of Mechanical Engineers?—Yes.

4896. And at present you are Head Organiser for Drawing and Hand-and-Eye Training to the Commissioners of National Education in Ireland?—Yes.

4897. Before that I think you occupied a position in Birmingham?—Yes.

4898. What position was that?—I was Director of Manual Training to the Birmingham School Board.

4899. For the Primary or Board Schools of Birmingham?—Yes.

4899A. I suppose you have heard that it is only University Education that we are empowered to inquire into?—Yes.

4900. And, consequently, in whatever remarks you may make upon training in the Elementary Schools in these practical subjects, you will keep that point of view before you?—Yes.

4901. I would ask you to develop what you wish to say with regard to the first paragraph of the Summary of your evidence, viz., as to the practical work that is being carried on in Elementary Schools that will specially lead up to and feed Technical Colleges, and, subsequently, the technical departments of the Universities?—The practical instruction which is now being introduced into Elementary Schools in Ireland is a training and preparing for the higher branches of Technical Education. There is no one particular trade taught, but the aim sought is to teach children to be orderly and methodical in all the work they do; to have correct methods; to be accurate and observant in the minutest details, and, as far as possible, to teach them to adapt and apply the knowledge they gain to some practical use. Special attention is devoted to getting the children to express, in correct sequence, the results of their observations, and to test inferences drawn by actual experiment. The three methods of expression, namely, showing, describing, and by means of drawings, are severally and conjointly used, the children being not only asked to interpret these, but also to express them, first, in performing the experiment carefully; secondly, in accurately describing it in clear and simple language; and, thirdly, in making the necessary drawings. This training, I consider, does especially tend to fit the children for the requirements of any branch of Technical Education. It should be, I consider, the foundation of all education, and especially of all who contemplate following any technical or agricultural pursuit. It creates a liking among the children for practical work and, to those who are found to be skilful at it, it will naturally give the desire to follow it on to the higher and more advanced work, which should form part of the curriculum of Technical Schools and Universities. In this way the work we take in Elementary Schools will provide the material that will feed the Technical Colleges, Universities, and workshops of the country. That is as far as concerns the feeding of the Technical Schools and Colleges, and leading up the training for that purpose.

4902. Now, will you proceed to your next point:—"As with an elementary literary training, so the equal necessity of an elementary manual training for quite young children, to render the utility of College training more effectual"?—The achievement of such a training as just set forth is, I believe, only possible by the children doing that practical work which will tend to the cultivation of accurate manipulation of the hand and observation of the eye, together with the reasoning powers of the mind. The manual work taught is purely educational, and not in any sense the labourers' work usually given to children on entering the workshops. It has for long been recognised that a literary or classical education should be begun with the young, but it is quite as essential that the muscles, nerves, individuality, sense of touch and sight, and power of originality and conception, should be quickened, stimulated, and encouraged, before age and habit have benumbed and narrowed their capabilities. If this training is not begun at an early age in the Primary Schools its accomplishment afterwards will be difficult, tedious, and slow—thus causing much of what otherwise would be valuable time in the Colleges to be spent in learning preliminary principles.

4903. The next point you wish to develop is, I believe, with regard to the need that you believe there is for Technical Schools and Universities in Ireland, to carry forward to a higher and more practical use the acquirements learnt in the Elementary Schools?—Yes. There is a great need that all who study that branch of education, which we may call practical and utilitarian, should have the same privilege of obtaining Degrees, Diplomas, and Scholarships equal to those given to students of Classics, Mathematics, Science, and the professions. Engineering is taught and recognised by two or three of the Universities, but there are other industries than Engineering, and I am not aware that any other branch of industry, such as architecture, agriculture, the manufacture of fabrics, decorations for industrial purposes, inventions of marked merit, &c., have been systematically or adequately recognised, or even substantially encouraged by the government of any University or College. The need for Diplomas, Scholarships, and Awards, in those subjects, and the right claims they have on the country, will be more and more felt as the absolute necessity of their study is forced upon us. It would be a great stimulus to young students of technique if Universities, Colleges, and Technical Schools would more fully recognise the importance of a practical training by letting it take a place in the examinations, or in some other practical way, honour the vocation of manual work. The very fact that the higher educational institutions favour the work of the hand, as well as that of the brain, would do much to rid the country of that silly prejudice against manual work, and leave no excuse for parents to say (what they often do): "My boy, when he leaves the Elementary School, is to have an Intermediate and College education, and perhaps go on to the University if he is fortunate enough to get a Scholarship; I, therefore, see no reason why he should waste his time in manual work."

4904. The next point you wish to develop, I think, is the advantage of a practical training as developing the general intelligence of the student, and the aptitude it gives to apply knowledge readily and to the purpose?—Yes; one of the effects of a practical training on the general intelligence of the student is, that it imparts caution, accuracy, and carefulness. Positive assertions are usually the outcome of ignorance, or of knowledge acquired purely from theory. When a practical test is applied, the student finds in its working many unforeseen conditions and practical difficulties which he had overlooked; and thus experience teaches him to be very

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cautious before making or asserting his observations. It also gives a greater desire to the student to understand all he reads or hears, and the wish to test any theories propounded by experiment, or otherwise, and practically to make use of any knowledge he possesses. In accomplishing this he has to rely on his own resources, frequently with scanty material and apparatus. Practical as well as experimental work cannot always be carried out under the most favourable circumstances. There are many hindrances, not met with in theory, and this very fact brings out the capabilities and resourcefulness of a student, and teaches him to apply and make the most of all the knowledge he possesses. Another marked effect of a practical training is that it greatly assists the child to think, and to arrange his ideas in logical sequence. This is how we hope to train the child to obtain the greatest advantage from University Education, and I would, therefore, urge upon this Commission the importance of providing an extended and comprehensive continuance of the work which we are now starting in the Elementary Schools.

4905. You had very considerable experience when you were in Birmingham of the work you are now organising in Ireland, and I think the Commission would be glad to know what facilities were offered there for the continuance of this practical work, which is commenced in the Primary Schools, in the Technical Colleges, and also in the new Birmingham University?—The Municipal Technical Schools carry on the work on exactly the same lines as those taken in the Elementary Schools. At the time I was leaving Birmingham, the University had only just been started, and, therefore, I am not in a position to say how they have taken up the work; but I believe they are taking it up.

4906. But in the Municipal Technical Schools in Birmingham, the lads from the Primary Schools were encouraged to enter?—Yes, certainly.

4907. And they remained in the schools until what age?—They remained there sometimes up to eighteen years of age.

4908. And did they attend evening classes solely, or also the day classes?—The evening classes solely, up to eighteen.

4909. Were they encouraged by means of Bursaries, or anything of that kind, to continue their education beyond the Primary School age?—No, not that I know of.

4910. I suppose these inducements are not so necessary for them if they attend only the evening classes, as, of course, they would be necessary if they had to attend day classes, because they could not then continue at their own work?—That is so.

4911. Do you think it would be desirable in Ireland for the Boards of Education to offer encouragements and inducements to children in Primary Schools to go on to the Technical Schools, because I suppose you know that up to the present the great difficulty has been in providing material for the Technical Schools and Colleges?—I think it would be essential.

4912. Essential?—Certainly; and I think it would succeed, because the work we are carrying on must give the children a liking for the work, and a desire to carry it on.

4913. And I think that in your statement you pointed out that, as a rule, parents were not very anxious that their children should learn this practical work, because they did not see there was any money in it?—They did not see that there was either position or money in it, and position is one of the great things that some people think of. They think that a literary education gives a very much higher status than any manual work possibly can.

4914. From your experience of Irish schools of the last two years, are you of opinion that the cause of the comparative failure of Technical Education up to the present in Ireland has been the dearth of material supplied by the National Schools?—In the Technical Schools you mean?

4915. Yes?—There has not been very much Technical Education carried on.

4916. In some places, as you know, in Galway, they have a Technical School, and here in Dublin they have a Technical School, and at other places. You think that kind of education should be encouraged and extended?—I should say myself that certainly it should. You must begin the work with the young.

4917. Have you found that up to the present the students going to Technical Colleges really have to begin the work that ought to have been done in a National School from the time they were seven or eight years of age?—We have found that both in England and here.

4918. Also in England?—Also in England.

4919. And I suppose it is true to a certain extent in Ireland?—Very much so. In regard to Birmingham, there was a marked difference at the time I left Birmingham from the time when I went there. When first I went to Birmingham there was no manual work attempted in the schools at all; we had to begin at the very beginning; whereas, when I left, they were at least six or nine months in advance of the state they were in when I began. We had to teach them the preliminary principles; they did not know what accurate measurement meant when they came to us first.

4920. Mr. Justice MADDEN.—This early training of eye and hand in the Primary Schools has been adopted within comparatively recent years?—Yes.

4921. Have you had an opportunity of following the career, upwards through an Intermediate or a Secondary School to the University, of any pupil who had the advantage of that early training?—No, not so far as that. I have had an opportunity of watching them through the Technical Schools and gaining distinctions there.

4922. In the Technical Schools?—In the Technical Schools, yes.

4923. Have you been able, from actual experience, and not merely from theory, to observe the effect of the early training of eye and hand?—Oh, yes, and particularly in the workshop.

4924. Particularly in the workshop?—Yes; we have a great number of managers of workshops who apply to, say, the Birmingham School Board for children who have already received this instruction, and distinctly stating that the last boys they had were so successful that they were able to put them on really responsible work, whereas, otherwise, they would have had to keep them down to drudgery.

4925. There is a growing appreciation of the value of the higher class of manual work, is there not?—Oh, certainly.

4926. In one sense I suppose you might describe the work of Phidias or Raphael as manual work?—Of course it is, in one sense.

4927. In one sense?—Yes, but scarcely so from the industrial point of view.

4928. Still, it is done by means of the eye and hand?—Yes; but I should add that in the Elementary Schools we are not in the least trying to make the children artists of that description.

4929. You do not aspire to that, but at the same time, I suppose, if a boy had an artistic temperament, that early training of eye and hand would facilitate his upward progress?—Undoubtedly so.

4930. I observe that you are a member of the Institute of Mechanical Engineers?—Yes.

4931. What is the constitution of that body?—It is a body that is formed of a very large number of mechanical engineers, and anyone who has done any distinguished work of any kind and been in practical workshops is entitled to be a member.

4932. It is not an educational body?—They do a good deal of educational work, but the main point is to advance Engineering. Of course, there is always the discussion of papers; papers are read, and so forth, at the meetings.

4933. Might I ask where you obtained your practical training as a mechanical engineer?—I was, first of all, apprenticed to the engineering trade for seven years, and then after that I went on for another three years in the workshop; then I got the Whitworth Scholarship; then I went to the Technical College in London, at the People's Palace; and from that time I have kept to the educational side.

4934. There is a great demand throughout the world for properly qualified mechanical engineers, is there not?—Certainly.

4935. And an increasing demand?—Yes.

4936. In connection with electricity and other departments, in Ireland also there is a considerable demand?—Oh, yes, I think so, certainly. I do not see why the Irish should not develop as many engineers as England.

4937. As a matter of fact, there are a good many mechanical engineers employed in Ireland?—Oh, yes.

4938. Has it come under your notice that a large proportion of them receive their education outside Ireland?—I have not had that brought before me.

4939. Perhaps that has not come under your special notice?—I should imagine that that would be so; but I could not say.

4940. Are you acquainted with the Royal College of Science in Dublin?—No, I am not.

4941. I suppose a high class Technical School or College would be useful for the instruction of mechanical engineers?—Extremely useful—something on the lines of Mason's College. It would be extremely useful, and if you could take, not only Engineering, but some other technical subjects, and give Scholarships somewhat similar to the Whitworth Scholarship, it would be of great assistance.

4943. How is the Whitworth Scholarship obtained?—There is a practical examination, as well as a theoretical examination. That is the only examination that really I know of in technical work that includes a practical examination, and is under the sanction of the Government.

4944. For the efficient training of mechanical engineers, I presume that a properly equipped laboratory is essential?—Absolutely.

4945. That, if regard is had to modern requirements, is a costly affair?—Well, of course it would cost a good deal; the equipment itself would cost a considerable amount.

4946. For the purpose of training efficient mechanical engineers, and for the purpose of training persons skilled in the application of Science to the various branches of industry, would you prefer one central and thoroughly equipped laboratory in the city, to a number of less fully equipped establishments?—I should prefer to start with one good one. Let there be some branches afterwards, but start with one good one, I should certainly say.

4947. Most Rev. Dr. HEALY.—You recommend the manual training, the hand-and-eye training, for all boys in Primary Schools?—Yes, and girls.

4948. And girls?—And girls.

4949. Speaking of Secondary Schools, you are aware that in the Secondary Schools there are a number of pupils that are designed for what used to be called the learned professions?—Yes.

4950. For instance, the Church, and the Law, and the Medical profession?—Yes.

4951. I quite understand how intending Medical students would profit very much by that manual training; but do you think that manual training in Secondary Schools would be useful or desirable for boys who were intended for the Church or for the Law?—I think it would be most desirable in any profession. It not only fastens upon the students the knowledge that they gain, but it makes them understand it very much more easily. With children you cannot talk in the abstract; they must have something to handle, and touch, and talk about, and that is practically what we give them the work for.

4952. Does it aid, in your opinion, in their intellectual development?—Certainly it does. It trains them to evolve their inferences in logical sequence, because the thing is bound together in the right order. They cannot cut and jump, as they can in theory, from here to there; there are experiments going on, and as the experiments go on they take step by step each thing as it occurs.

4953. So that you think it really is of educational advantage, even for those students who never intend to use their hands in that sense?—Yes; it is eminently educational.

4954. Professor LORRAIN SMITH.—You made a remark about employers of labour taking children who had had the manual training?—Yes.

4955. Was that as apprentices?—They take them as apprentices, yes; but they are not paid apprentices.

4956. Would you develop that statement? Would it refer to Technical Schools also?—For instance, in Birmingham, we frequently received letters from managers stating that they wanted a boy about fourteen years of age, who could use a file, or who was able to do some other particular branch of work, and asking whether I had anyone whom I could recommend out of the sixth standard. I would look through the list and say, "Here is a very good boy." I would ask that boy, "Do you want a situation?" and if he said "Yes," I would tell him to go to that place. The manager would take him, and six months afterwards I would get a very nice letter from the manager, thanking me for sending that boy, and saying how nicely he had got on, and that he was far in advance of other apprentices who were often older than the boy in question, and who had been in the shop twice as long. When boys go into a workshop they are not taught; they are simply given a piece of work to do, they are shown how to do it, and they go on with it: it is simply labourer's work. The manager looks upon the work simply from a manufacturing point of view; he does not care for training the children.

4957. Have you had a similar experience in regard to the higher Technical Education?—In the higher Technical Education, most likely, the students have already got positions before they enter the evening classes.

4958. Yes, they have got positions; but I mean as showing a similar response on the part of employers of labour?—You take the men in the higher positions in any large manufacture, and you will find that they are just those who have attended Technical Schools. That will prove fairly well that it is those who attend classes that get on in the work. They cannot learn the work so much at the schools, but they learn the theory of it at the schools, and they practise it in the workshop.

4959. Your experience is that it is a practical benefit?—That it is a practical benefit.

4960. In the sense, if I might so put it, of getting on in their profession or occupation?—Yes.

4961. In regard to certain technical branches of education it has been suggested that students who go to the higher Technical Schools or to the Universities should have a certain privilege—that of being remitted a certain part of their apprenticeship in virtue of having passed their technical course, or taken a diploma. Have you any experience of that? I think the apprenticeship system is really dying out, is it not?—I do not see how that can possibly be, because the apprenticeship now is usually not with a paid premium at all, but simply that the employer pays so much to the apprentice who comes in, and if he is not worth it he has to leave, while if he is worth more he will go elsewhere, or he will stay on and get an increase there. It is really merit now that is taking the place of the premium.

4962. Merit?—I should say it is.

4963. So that any additional advantage such as he would derive from education is felt directly in his more rapid progress?—Yes.

4964. That is what I wanted to bring out. Now, there is one other point. You spoke of diplomas or degrees?—Yes.

4965. And you mentioned several subjects, such as Inventions and Decorating. How would the higher schools or the Universities meet a demand of that sort?—That wants very careful consideration indeed. I am not in a position to develop any scheme, or to go into detail in the least degree. The only point that struck me was that in Engineering there are these degrees, and in any other profession there is a degree—a handle, you may say, to a man's name; but in the greater number of industries there is absolutely nothing. A man may excel, we will say, in pottery work, or anything else; but he has no chance of being taken notice of by the Colleges—except he gets a knighthood when he is very old, or something of that style. But I think that when a student, after he has left the College, gets on in his profession, and makes a good name, the College might recognise it by giving him a diploma of some kind.

4966. You mean after he has got on?—After he has got on.

4967. Would it not be rather the aim of the College to recognise it as a part of the education?—That could not be done to the same extent; he would be too young to have done anything very "national," as you might say. Of course, if he gets on—there should be a tripos, we will say——

4968. You are asking for a recognition somewhat later?—I am asking for both, really, in one, because I think there might be examinations in the Colleges that would include manual work in the particular branch the student had been studying and getting a degree in.

4969. In regard to that matter, of course there is always a desire to have a University stamp rather than a diploma merely?—Yes, certainly.

4970. In these circumstances, what would be your idea of the University course or curriculum for such a degree?—Supposing, we will say, the University, instead of taking up only one subject, such as Engineering, took two or three to start with. They have already a tripos of Engineering; they could also have tripos of some other branches of industry.

4971. How far would you include general culture in the curriculum?—I should include that, certainly. I

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am not recommending manual work alone. Of course, theory must go with manual work. Manual work alone would be of no use at all.

4972. How far would you include literature and the study of Sciences?—I would not recommend so high a standard of literature or Science in the case of such a curriculum as would be required for students who did not take up manual work. There, of course, should be a certain amount of Literature and Science.

The Witness withdrew.

FRANCIS GRANT OGILVIE, Esq., M.A., B.Sc., Director of the Edinburgh Museum of Science and Art; formerly Principal of the Heriot-Watt College, Edinburgh, examined.

Francis Grant Ogilvie, Esq., M.A., B.Sc.

4973. Mr. Justice MADDEN.—Mr. Ogilvie, you are Director of the Edinburgh Museum of Science and Art, and you were formerly Principal of the Heriot-Watt College in Edinburgh?—Yes, my lord.

4974. I observe that you hold the degrees of Master of Arts and Bachelor of Science—of what University?—Master of Arts of Aberdeen University, and Bachelor of Science of Edinburgh.

4975. The Heriot-Watt College was founded in order to make provision for the technical and general education of the industrial classes, and I believe it has certain relations with the Edinburgh University. Therefore, anything you can tell us about the constitution and the working of the College would be interesting and important, having regard to the nature of our present inquiry. That College is an offshoot, is it not, of the well-known Heriot's Hospital in Edinburgh?—Well, to this extent. The College itself is the direct development of the Watt Institution and School of Arts, which, in turn, was a development of the School of Arts in Edinburgh, an institution, established in 1821 as a mechanics' institute. In 1885, the Watt Institution and School of Arts, which had until then been able to do its work merely by private subscriptions and the usual sources of revenue available for such institutions, was constituted part of George Heriot's Trust, which the Royal Commission then sitting established to take over George Heriot's Hospital of previous time. The Trust maintains and governs George Heriot's School and the Heriot-Watt College, and it provides a number of Foundations, Bursaries, and Scholarships. The name Heriot-Watt College dates from 1885, when the Heriot Trust assumed the responsibility of the institution.

4976. And the Heriot Trust was founded by the well-known goldsmith, was it not? Is he not one of the characters in Sir Walter Scott's novels?—Yes; he is described in "The Fortunes of Nigel."

4977. Will you tell us, so far as you think necessary, the constitution of the Heriot-Watt College, and the work done by it in regard to Technical Education, with special reference to its relations with the University?—Perhaps I ought to give you first a few sentences in reference to the evening classes' work.

4978. Take your own course, Mr. Ogilvie; I am merely indicating to you the special nature of our inquiry, but I am sure that we should all wish that you would take your own course in developing your evidence?—I wish to do so, because the funds available for the College are specifically directed, first, to the developing of evening classes, and, therefore, the work done in the College in the day classes has been conditioned by the fact that the endowment might not be used directly for their support, although the day classes are authorised to utilise all the provision in the way of buildings, apparatus, appliances, and general expenses, which are provided for the evening classes, that in itself constituting a valuable endowment for the day classes. In order to understand, the expenditure of a considerable annual revenue without a very great development of day classes, it is necessary that you should realise that the College exists, in the first place, for evening classes. These are classes conducted in the College with a special view to the technical and commercial as well as the literary education of young men and women employed in and around Edinburgh, the number of students in the evening classes being about 3,800. These are individual students in the evening classes, and their education forms a first charge upon the endowment so far as it refers to the Heriot-Watt College. The work done in these classes takes account of the fact that the students are gaining practical experience in the workshops, offices, or manufactories of the district, so that it is distinctly co-ordinated with that training. It is intended to be a part of their complete Technical or Commercial Education as the case may be. I should say, as bearing upon the present inquiry, that many of these classes are of a very advanced character, and that they do attract students who are themselves University students, while, of course, many of the students who are not University students are doing work which is quite of a University standard. The attraction of University students has naturally been largest in the case of classes which are not fully developed in the University, of students who, while giving the requisite qualifying attendance at University classes, desire to take advantage of other facilities afforded in the town for their education. Then, not infrequently, a young man (or it may be a young woman), studying in the evening classes, finds that he has a special aptitude for higher work, or finds that for the higher walks of life in the profession for which he is training—that of engineer, mining engineer, chemist, or whatever it may be—he would require a fuller opportunity than the evening classes afford. Such a student is encouraged by means of a Bursary to give up his work during the day, and to devote some time to complete technical study in day classes. This may be either in the College or in the University, or partly the one and partly the other. I think these are the only points with regard to the evening classes that really affect the present consideration, but if there are any others that occur to you I shall be very glad to deal with them.

4979. If you will develop your evidence consecutively throughout, the members of the Commission may then ask you some questions with regard to it?—Very good. The day classes at the College are as fully available for the industrial classes as possible. That is to say, the fees are not high, and there is a certain provision, by means of Bursaries, for the young men being assisted in their work, and there is provision, apart from the Bursaries, for the Governors remitting entirely, or partly, the fees of any student belonging to the industrial classes, or, in fact, any student who requires aid, who could not attend the classes otherwise. So that the day classes are amply available for students of the industrial classes. At the same time they afford full means for "better-class students," and I mean by "better-class students," students in a better financial position only, because it by no means follows that they are the better students—but students who are in a position to devote several years to systematic study before going to work. Such students enter the College after completing a good Secondary School education. That is an essential point in the work. They have to show on entering the College that they have a good knowledge of Elementary Mathematics, and that their composition and general literary training is sufficient for them to enter with advantage upon the work of the course.

4980. Is there a Matriculation examination, or do you take the "leaving certificate"?—The leaving certificates of the schools in Scotland are so fully developed now that they practically afford sufficient evidence.

4981. They take the place of Matriculation?—Yes. But wherever that evidence is not available the student is examined in the subjects. Then the classes afford continuous courses of instruction suitable for mechanical or electrical engineers or manufacturing chemists. There is also a School of Art in the day classes, and the classes are arranged so as to form a suitable course for other students who come to them before they go to training, say, in a workshop. Take, as a typical case, that of Engineering. Before going to his apprenticeship, a student may take a course in the College, which may be from one to three years. Even a one year's course is of advantage to a young man whose previous training has been principally literary and mathematical, because it gives him a certain training in observation, and a readiness to appreciate points he may see in his practice in the workshop. So that it is not infrequent for a student to come to the College for one year in the day classes, and then go to his apprenticeship, or practise in the workshop for two, three, or even four years, while he continues his work in the evening classes, and then return to the day classes at the end of that to take up more advanced matters of study. In

that way the day classes, I think, correspond very closely to the stage of work that you are at present considering. Then with regard to the relation to the University. When the day classes were properly organised, application was made to the Universities of Edinburgh and Glasgow, as those Scotch Universities which conferred degrees of Engineering, and they recognised as qualifying for the attendance and preparation required in accordance with their ordinances, such day classes as those in Mechanics, Physics, Technical Drawing, Mechanical Engineering and Chemical Laboratory work. That is to say, that a student of the Heriot-Watt College or a student of the University may attend for the preparation required in any one of these subjects, a class at the Heriot-Watt College, or a class at the University, the University having classes representing these subjects. The lines of the teaching in the Heriot-Watt College, however, do not necessarily follow the lines of teaching in the University. The University Commission laid down in its ordinances certain minimum amounts of instruction, specifying the instruction by hours. The custom in Scotch Universities has been—I do not mean to the present day—but the previous practice was that the instruction given by the Professor was entirely by lectures in certain subjects, there being supplementary courses of practical work, and there might be supplementary tutorial classes, but those were not developed very largely. In the Heriot-Watt College the courses differ from that. The number of hours is very much larger than the minimum specified by the Commission, but a great proportion of these hours are in laboratory work or in tutorial work. So that the course is of a different kind, and it may be on that account preferred by technical students, or it may be—well, students may not prefer it because it takes longer time. The practice in Edinburgh University, however, is under process of alteration, so that I do not suppose that that difference will exist very much longer.

4982. Professor LORRAIN SMITH.—You mean that there are fewer stated lectures in the Heriot-Watt College?—I should think that the number of stated lectures in the Heriot-Watt College would be, if not quite as large, at least very closely approximating to the number of hours in the University, but a student in the Heriot-Watt College is required to take along with these at least as much time spent in the laboratory, not for a separate course of laboratory work, but a correlated course of laboratory work, and with that tutorial work. However, that method of instruction is now being carried on in the University as well. One point I wish to emphasise in regard to the previous arrangement with the University. The Heriot-Watt College developed an Engineering department with fully-equipped laboratory, Professors, and the staff necessary. The University had Electrical Engineering as one of the sections of study for one of the Final B.Sc. examinations, but they have not developed—I ought, perhaps, to say they have abstained from developing any course of preparation in Electrical Engineering, as they have recognised the Heriot-Watt College class, which is, as a matter of fact, the only class so recognised. So that any student in Edinburgh University desiring to graduate with Electrical Engineering as one of his subjects must come to the Heriot-Watt College. I mention that because there is a conjoint course of study at the present moment under consideration in the University, and it is in fact a development of that system; that is to say, that the University and the Heriot-Watt College are arranging at the present time a course of study, by which the resources of both institutions will be made fully available, and between them they will constitute a very complete curriculum for students of Engineering in any one of its departments. The remaining sentences in my Summary of Evidence are on points of my own personal opinion. Do you wish me to go through these?

4983. Mr. Justice MADDEN.—Yes?—It is my view that in the education of industrial students—that is, education in the class-room, carried on alongside the education of the workshop or the office—we in Britain have done quite as much as any other country, and that the system of technical instruction for these students here is at least abreast, and in most cases, it is in advance, of that which is given in other countries. But for those students whose social circumstances render them likely to have an early opportunity of exercising authority, of being in positions of power or influence in the industrial world, we have not been able to secure sufficient preparation. There have been in different parts of the country facilities—ample facilities—offered for the education of such students, but it has not become the practice or the custom—the general practice or the general custom—of men engaged in manufactures or industries to see that their own sons, or the sons of their friends, who are likely to come into their businesses, should have that scientific and technical training which the best institutions in Britain, like a number of very large first-class institutions abroad and in America, do afford. There are a great many causes for that, many of them social, some of them simply from the non-existence in Britain of certain incentives, or, in fact, of certain pressure which exists in other countries. But the cause which affects the present inquiry is, I think, that the Universities have figured on their prospectuses, calendars, and so on, courses which went by the name of Engineering, but which were not adequate, this want of adequacy being mainly due to inadequacy of the provision for instruction. Students have thus gone out from Universities with the name of having had a training in Engineering, and when they have gone to practical work—as naturally followed when they had had an inadequate preparation—the preparation afforded has been discredited, and the natural result has been that manufacturers and others have not been encouraged to send their sons there. "Give a dog a bad name," &c. The result in this case has been that even those full and complete courses of Engineering which are now provided in Britain have not been taken advantage of. It will take some years, I have no doubt, to get over that difficulty. I personally think there is a distinct advantage in relating higher technical instruction to the Universities. I say "in relating it to the Universities," because the conditions under which a University is founded may make it necessary to have the relations rather of a loose kind. Many of the older Universities are so bound by regulations, by tradition, and by custom, that Engineering education could not be of a satisfactory kind inside them. But that, of course, does not hold in a case where one is considering a new University altogether. I do not know how far it affects your position here, but that is another affair. What I mean is that higher technical instruction must proceed upon a thorough basis of Science teaching, and this basis may be wide enough to secure such general culture as to warrant the Universities in recognising an Engineering student as an educated man, and, therefore, warrant them in conferring degrees upon such students. But such higher technical instruction must at the same time—in its later stages, at any rate—at every point have a definite relation to practice. So much of the course being of a general scientific kind, it is obviously related closely to work which, in any case, is carried on in a University. Therefore, there is a possibility of economy in the carrying out of the work in relation to the University. All the distinctively technical branches, however, should be under the supervision of men who are in effective contact with present-day practice, men who can hold the confidence both of the student and of practical men. Now, that is not incompatible with the position of a University. I mean that a Professor or lecturer in a University—in any case, a Professor—may have opportunities—fully-authorised opportunities—of taking that practical work without in any way being prevented from giving full or sufficient attention to the work in the College. There is no objection to—in fact, in my opinion, there is a necessity for—a Professor being a man whose training makes him likely to be consulted by engineers in reference to matters that arise in practice, and whose ability is such as to induce outside engineers to consult him in that way. If this is the case, then you have a Professor with a definite monetary inducement to keep himself abreast of the work which is going on at the time. Of course, a Professor may be sufficiently interested in his work to keep himself abreast in all such matters without any inducement of that kind, but I think from the point of view of public policy, it is a distinct advantage that he should have a definite inducement to do so. With regard to students, on the other hand, the long period during which Universities have been a strong factor in educational work in Britain and Ireland makes the University curriculum one that attracts any young man who wishes to be educated. The advantages that he sees in spending a few years at a University are such as to tempt him to give more than a very short time to adequate preparation. Then there is the definiteness of aim which is afforded to him by the prospect of getting a degree, which would tend to keep him continuously studying in one direction. Then, again, there is the convenience of the degree, if it is recognised through its own merit as being of a certain

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absolute value by men engaged in industries; it is a very convenient and simple and ready means of indicating an adequate amount of preparation. Personally, I attach some importance to the fact that if our leaders of industry had training inside a University they would be brought in contact with men whose aims were in different fields; they would be brought into that contact at a time when they were most impressionable; they would therefore be likely to be men of more liberal culture, men of wider outlook, and men more likely to benefit, not merely themselves, but the community at large, when they came to be, as we would hope to see them, leaders in the industrial world. On that ground I think it is very desirable that such young men should, as far as possible, be brought within the influence of a University curriculum. You will notice that in all I have said I have spoken of Professors, teachers, and lecturers, in a technical course. I think that great harm has been done in the past by the establishment of weak courses of preparation in technical work at too many centres. I would rather have them few and strong. Such a course must be full. It should have a sufficient number of teachers, and their status in the institution and in the district in which they are situated must be such that they are respected, that they form a definite and valuable part of the intellectual circle in the district; and in whatever subjects they are teaching their teaching must be absolutely free, beyond any cramping defect from tradition, or from the nature of the subject in the past. They must be free to adapt their subject and the methods of teaching in such a way as is most suitable to the need and the mental development of the student. The subjects are always changing; the methods, therefore, should be free to change with them. Then there is only one other point. I think no technical department, whether in a University or otherwise, is likely to be a success if it is otherwise than in a locality where technical work has the respect which is given to a department of importance to the country. Such is always the case in the capital, where, apart from being the centre of companies and so on, there is the necessary relation of the law courts, and the final arbitrament of all technical cases. I am speaking of Edinburgh, and I suppose it would be the same with regard to Dublin. The capital is naturally a centre of the industrial world of a country, even although there may be no great industrial work done in it. In that way you have in such a place—just as you have in a large manufacturing centre but as you have not in any country town where there is no such work being done, and no aggregation of technical, or engineering, or industrial people—an influence which makes the work respected.

4984. It is interesting to learn that you have in Edinburgh, existing side by side, a University and a School for higher Technical Education, absolutely independent in their constitution and government, and yet each availing itself of the work done by the other, and leading up by their conjoint work to the attainment of a University degree. That is so, is it not?—Yes, that is so. I ought to say that, in the past, it has not been so to any very considerable extent.

4985. That is so to a certain extent at present?—Yes.

4986. And you have said that you look forward to a fuller development of the same principle of co-operation?—Yes.

4987. Therefore I conclude that so far as it has gone at present, it has proved a success? From the circumstance that you desire its fuller development the application of the principle seems to you to be right?—The principle is absolutely right. It is so recognised by the University authorities, by the Heriot-Watt College authorities, and by others in the district, and it is because of that that the work is being developed now.

4988. You look forward in the immediate future to a development of that principle?—Yes.

4989. The University of Edinburgh, you told us, has not established a course of Electrical Engineering?—No.

4990. Is that attributable to the necessity that exists for very expensive apparatus and laboratories for the purpose of the course of study?—The importance of the subject was not realised by the University until the laboratories and staff had been established in the Heriot-Watt College.

4991. Is there in the Heriot-Watt College a fully-equipped laboratory for the purpose of teaching Applied Science?—Yes, in certain branches.

4992. I suppose it would be undesirable, or, at least, it would be an unnecessary expense to duplicate that provision in the adjoining University?—Should the arrangement now under consideration be carried out, some of the appliances in the University may be sold, and replaced by others which do not exist, or do not correspond to things in the Heriot-Watt College. Just as the higher teaching in Engineering in the University will take lines which are not represented in the higher teaching in the Heriot-Watt College, so the laboratories in the two institutions will contain corresponding appliances only in so far as those are necessary at every point in Engineering.

4993. I suppose that if, in Edinburgh, there happened to be two or more teaching Universities, the development of the same principle would suggest that one and the same Technical College with its expensive appliances and laboratories might be utilised by them all?—Certainly.

4994. In co-ordinating the course of study in a University and in a Technical College leading up to a certain definite degree, might not the purely scientific teaching—such subjects as Geology, and matters of that kind—be taken in the University, and the practical work in the laboratory?—At the University?

4995. Yes?—In teaching Geology in Edinburgh there would be no necessity for any instruction being given outside the University. The teaching of Geology and the geological laboratory work would all be taken in the University.

4996. I mention that for this reason: that none of the disputable matters which are sometimes connected with the teaching of Natural Science as Science enter into the practical work of a laboratory?—No.

4997. For instance, a man who is working at electrical machines does not need to trouble himself with theories as to the way in which the world came into existence. What I mean is this: that the theoretical teaching, the purely scientific teaching, might be conducted by University Professors, and the courses in practical work conducted in the adjoining practical school of a higher technical character. Is that what you contemplate?—I am not quite sure that I understand you as to the meaning of the word "practical."

4998. I will tell you what I mean. Supposing there were, in Edinburgh, two teaching Universities, whose views as to the mode of teaching certain branches of Science differed. It would be possible for the students aspiring to degrees to go through a course of scientific training other than of a practical character in either of those Universities, and to avail themselves of the practical technical teaching in the common laboratory?—Yes. I should like to answer your question in this way: that as regards the teaching of Science, the practical laboratory work is as essential as the lecture teaching, and that it ought to go on correlated with that. In Geology, for instance, the natural arrangement would be for the Professor in the University to instruct the students in the Science of Geology, but apart from special applications. I make a distinction for convenience between practical work and applied work. For instance, while the Professor in Geology would have, and does, indeed, now have, practical classes for the instruction of his students in the study of minerals, and rocks, and in Geological Drawing, he would not necessarily trouble himself about, or would not necessarily have, the supervision of the teaching in Mining, or anything of that sort.

4999. That is precisely the distinction I desire to make. Would the Professor have a laboratory?—He would have a laboratory.

5000. In so far as it was required for his own teaching?—Yes; the Pure Science of Geology, so to speak, that would be the natural arrangement.

5001. Quite so. And there would be a different laboratory, and apparatus of a different kind, for the teaching of Practical Mining?—Yes; and for other practical applications of the Science.

5002. And the two things are quite separable?—They are quite separable.

5003. You look forward to the development of University training, not only for the purpose of instructing mechanical and electrical engineers and persons actually engaged in practical work, but in order to elevate the general tone of the leaders of industry?—Yes, I do.

5004. What degree would you suggest, or what course of training would you suggest, as specially adapted for the latter purpose? Do you think a common course of training would be suitable for both purposes, or would you have a special course of training directed more particularly towards the last-named?—No, I should not. I do not think I quite said "to im-

prove their tone." I do not remember putting it in that way at all. What I rather had in view was widening their outlook.

5005. I will accept your words; I did not intend to use the expression in that sense. You say "to widen their outlook"; that is to say, by infusing an element of liberal education?—Yes, quite so. I think the special course should be sufficient, because you would necessarily have to justify the University in giving a degree to a man. If the course is based upon a sufficient and scientific foundation—I mean training in Pure Science—then that alone does much to bring a man into touch with Science from another point of view than that of its commercial application. He would necessarily have had an adequate preparation in literary work, in Languages—in English and at least one foreign language—before he entered upon the University course, and he ought, in my opinion, to keep up at least one Modern Language during his course. But, beyond that, I would not suggest any formal means of widening his outlook; I would trust very largely to the gradual effect of mixing with students who have other aspirations, and of coming to realise that there are various ends in life other than the ordinary commercial ways.

5006. What degrees, in addition to the ordinary degrees in Arts, are conferred by the University of Edinburgh?—There is the B.Sc. degree in Pure Science, which may be taken in many different combinations of subjects, so as to cover the case of men whose leading study—not, of course, whose only study—might be Chemistry, or Physics, or Mathematical Science, or Natural Science, in one part, or another—generally Pure Science. Then there is the B.Sc. degree in Engineering. That is the degree in reference to which my remarks have been made. Then there is the degree of B.Sc. in Agriculture. In any of these cases a man may proceed to the higher degree of Doctor. That requires ability and work of an advanced character. A man is required to undertake personal investigations of an advanced character, and to submit a thesis or statement of his own personal and private investigations, as well as to give full evidence of his advanced studies. These are the regulations at present; of course, they are not the old regulations.

5007. There is a degree of B.Sc. in Agriculture?—Yes.

5008. Where is the practical training for that degree obtained?—A student is required to have had experience upon a farm for twelve months, and to have benefited sufficiently by that experience to warrant a degree. I mean that his examination includes an oral examination, much of which, I understand, is devoted to ascertaining whether he has got that practical knowledge of the suject which is necessary. But personally I have not had much to do with students in Agriculture, and, therefore, I would rather that you did not take that from me.

5009. Only to this extent: I presume the Heriot-Watt College does not deal with that branch of practical instruction?—No; it does not. In the evening classes of the Heriot-Watt College we have always attracted a considerable number of Agricultural students attending the University. The Heriot-Watt College has also, by arrangement, conducted, for a College of Agriculture which is now being organised in Edinburgh, classes in the day time for the preliminary scientific training of Agricultural students. But it has had no definite relation to the University teaching of Agriculture as for the degree.

5010. You say that a College of Agriculture is being organised; but perhaps you are not in a position to give us any information about it?—Oh, yes, to a certain extent, if you care to go into it afterwards.

5011. Do you know whether the degree in Agriculture is much sought after?—It has been sought after more in the past than it is now, for two reasons: First, when it was originally established there were, in Britain, no other schools of Agricultural teaching. These schools have multiplied very rapidly, and therefore students from England have become less numerous in Edinburgh University than they used to be. The other reason is that the preliminary examination for students taking any degree in Edinburgh University has been considerably raised, and that students from schools elsewhere than in Scotland seem to find the preliminary examinations rather a barrier.

5012. To what ultimate goal do these students in Agriculture in Edinburgh University tend? With what object do they take the degree, as a rule?—The students in Agriculture?

5013. Yes?—Well, many of them in the past have been simply gentlemen who have sufficient interest in the scientific aspects of Agriculture to qualify themselves to go into it fully, although their ultimate aim was simply that of managing property, either their own or someone else's. But a very large proportion, not because it was their original aim, but because the force of circumstances has made openings for them, have been attracted to the organisation of agricultural work either for states such as in India and the Colonies, or Egypt, and so on, or to giving instruction in the numerous Agricultural Colleges. In fact, the success of the Edinburgh University, in regard to Agriculture, has, I believe, done very much to restrict its own supplies by supplying very excellent teachers for provincial Colleges elsewhere.

5015. Are there Agricultural Schools in other Scotch Universities?—The Edinburgh one is a very old-established School of Agriculture; I cannot say the exact date; but it must be about 100 years old; perhaps more. In Glasgow there has recently been established a Glasgow and West of Scotland School of Agriculture, and that has developed until it is now established in relation to many county councils in the west and south-west of Scotland. It has a certain relation to the University, but not so definite as that in Edinburgh.

5016 Do they give a degree in Agriculture in Glasgow or the other Universities?—I should prefer not to give evidence upon that. There are three Colleges of Agriculture now; but Edinburgh is the only place where there is a Professor of Agriculture in the University.

5017. You have had, for a great many years, a College of Agriculture in Scotland, and Agriculture in Scotland for a great many years has attained a high degree of perfection. Do you think there is any relation of cause and effect between those two facts? Would you expect to find them co-existing?—I think it would take some consideration to find which was cause and which was effect.

5018. At any rate, they are co-existing in Scotland?—Yes.

5019. How many students have you in the Heriot-Watt College?—Day students?

5020. Yes—can you give us both day and evening students?—There are nearly 4,000 evening students, and the day students—confined to students in Engineering and Chemical work, with a small Art School—number, I think, about 150. I am not Principal of the College now, you understand, and I cannot say the exact number; but it is at least 150.

5021. A certain number proceed to the University. Are they helped forward by Bursaries?—Yes; well, not more than one or two would go to the University by Bursaries from the Heriot-Watt College in a year. The Bursaries that are given only take them for one year. I mean, the Bursaries are not given from the Heriot-Watt College to the University. There are many Bursaries for three or four years, which are given by the Heriot Trust to students entering the University in the normal way from Secondary Schools. The Bursaries in connection with the Heriot-Watt College are only for one year after leaving the College.

5022. Most Rev. Dr. HEALY.—There are one or two things I wish to ask you about the relation between the University and the Heriot-Watt College. You have said, I think, that hitherto the University have recognised certain courses in the College as sufficing, so far as they go—as leading up to a degree?—Yes, that is so.

5023. That is the degree of B.Sc., is it?—Yes.

5024. What are those courses exactly—do you know?—The University has as one of the specific subjects mentioned for the first B.Sc. degree, the subject of Natural Philosophy. In the Heriot-Watt College we divided that subject—at least, we taught separately, and by separate teachers, as a matter of fact—the subject of Mechanics and the subject of Physics. Those two courses of ours were accepted by the University as equivalent to the University course of Natural Philosophy. Let me point out, in further elucidation of my previous remarks, that the University course of Natural Philosophy is a course of lectures, of 100. Our course in the Heriot-Watt College was about 120 lectures, about 40 tutorial hours, and about 120 hours in the laboratory—altogether, nearly 300 hours devoted to Physics. Then we had Mechanics, which was about another 120 hours, so that our course was a very different one from that of the University.

5025. It was a larger one?—Yes. Of course, for technical students we considered that all that was necessary.

5026. Did they recognise not only the practical teach-

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ing of your College, but also the theoretical teaching of your College in those subjects, as sufficing?—Oh, certainly; I have no doubt they would have recognised the theoretical teaching alone, but we would not take students for the lectures without the practical work.

5027. As a matter of fact, they do both the theoretical and the practical teaching in your College?—We did not ask them to recognise the theoretical separately in that subject; we considered it one with the practical.

5028. Had the University authorities anything to do with arranging the courses in your College?—Nothing whatever, except that if we offered to give a less amount of instruction than they specified as a minimum they would then have said, "You must give more." But that never happened.

5029. They had nothing to do with the examination of the students in this subject, had they? They accepted your examination?—Not for the degree; oh, no. The examinations for the degree were conducted by the University authorities, and we had nothing whatever to do with them.

5030. Even in this subject?—Even in this subject.

5031. That is what I wanted to bring out?—Then, perhaps I ought to say that in the past we did not press the practical outcome of this relation between the University and the College. We satisfied ourselves with establishing the relation in principle. The advantage to the Heriot-Watt College did not seem to make it worth while to press for more. Recently, however, the whole question has been under the consideration of a joint Committee, representing the University and the Heriot-Watt College, and that Committee has prepared a scheme for co-ordinating the teaching in Engineering subjects. Arrangements are so far completed that they have been submitted to the various Boards; they are not before the public; but the general principles which have been asked for, and have been recognised, both by the University and by the Heriot-Watt College, are, that as far as this point is concerned the Professors of the University and the Professors of the Heriot-Watt College should take the same position in reference to examinations in Engineering—that both should take part in the examinations, and neither be paid for it. You understand that in Scotland every degree examination is guarded by its being conducted jointly by the Professor of the University and an external Examiner. The arrangement that is desired, and is likely to be arrived at, is that the Professor in the University should act along with the Professor in the Heriot-Watt College, as representing the teachers, and that the outside Examiner should come in to act jointly with them in these technical subjects, just as the outside Examiner in any other subject does. I may say that the present Professors of the University, and the Professors who are concerned in this matter in Edinburgh attach very great importance to the presence of an outside Examiner, not merely to see fair play—that is not the idea at all. The idea is that by this definite contact between the teaching of the University and the conferring of the degree and the practical outside world you secure a very excellent and desirable means of having the value of the degree maintained and recognised.

5032. As it has been in the past, so in the future, you believe that the University will always claim a share in the examinations for the degree?—I think it is very desirable that that should be reserved. Wherever the teaching is conducted it is essential that the University which confers the degree should control the examination for it.

5033. That is the most important point I want to bring out. Now, with regard to that Agricultural degree in the University of Edinburgh. Could you tell us—because I am somewhat anxious to know—what sort of literary knowledge is necessary for obtaining that degree, or what literary course is required?—For the Agricultural degree or the Engineering?

5034. For the Agricultural degree—what you called a little while ago the Agricultural degree of the University?—No more than is required for the preliminary examination.

5035. There is no first year in Arts?—No.

5036. Merely a preliminary examination?—Merely a preliminary examination. But I ought to say that the preliminary examination requires a fairly high standard—what, apparently for English students, is a high standard. Its demands are on a level with the leaving certificate of the Scotch Secondary Schools, and that is now a well-established examination, and requires in literary work what, when I was a student in Arts, was certainly not more than represented by the first year in Arts.

5037. They require Latin, I suppose—a certain amount of Latin?—Yes, as an optional subject.

5038. Or would a Modern Language suffice instead of Latin?—The Calendar of Edinburgh University shows that the preliminary examination requires:—(1.) English; (2.) One of the following: Latin, Greek, French, German; (3.) Mathematics; (4.) one of the following: Latin, Greek, French, or German (if not already taken), Italian, or another language approved by the Senators, or Dynamics.

5039. Then a Modern Language would suffice instead of Latin?—Yes. The point is that there must be either two languages, one of which may be Latin, or one Language and Dynamics. That is the regulation. What I want to be particular about is that it is that regulation which has led, or is believed to have led, to a considerable diminution in the number of students from England going forward to the degree in Agriculture. That is one of the two causes.

5040. From your experience of University work in Edinburgh, do you think it would be desirable or practicable to have a University College with a literary side, in which these subjects could be taught successfully and thoroughly, and a technical side, or a Faculty of Technical Science also, in which the practical part and the theory also of Agriculture could be taught; that is to say, that in the College there should be two faculties—the Faculty of Arts, for the literary work, and a Faculty of Science, for this scientific work in reference to Agriculture?—Yes. Inside the University there is no Arts work required for Agriculture, for the degree; at least, that work is all required before the students come into the University.

5041. Supposing we had not any schools to train the pupils, to give them the literary training, could that be done in the College in which there would be a technical or scientific department also to do the other work?—It might be done, but I do not think it would be advisable to have it called a College class; it would be a preliminary class.

5042. A preliminary class?—Yes. There is a preliminary class of a higher stage in the Edinburgh University at present. In Mathematics, or Latin, and Greek, there are classes which are called graduation classes, and there are classes which are called non-graduation classes. These non-graduation classes represent practically what used to be the Junior Course in Latin, or Greek, or Mathematics, as the case may be, and the graduation classes represent the second year's course. The elevation of the standard in the schools has made the old first year's course really very little required, but it still exists in the University as a non-graduation class.

5043. Professor LORRAIN SMITH.—There are one or two points I want to ask you about, Mr. Ogilvie. Take the subject of Chemistry, as an example. You dealt a good deal with Engineering?—Yes.

5044. How far is Pure Chemistry, as distinguished from Applied Chemistry, taught in the Heriot-Watt College?—Very fully. In the day classes there has always been a continuous course of Pure Chemistry, because the Chemical course has been made independent of that in the University.

5045. You did not qualify by it?—I think that this year application has been made for its recognition, but while I was Principal, the subject of Chemistry did not qualify for the University. I may say that there were two reasons for that. One is that from the circumstances of the time, so long as we established the principle, we were not particular about the extent of recognition. But another reason was, that our teaching of Chemistry had, as necessary, an hour and a half in the laboratory for every hour in the lecture-room, and, while in the other classes, there was no doubt about our having more than enough lectures to qualify, we should have or might have had to discuss with the University the question of the acceptance of practical work as hours, and we did not want to have any discussion upon a point which really did not matter to us in the least. But we have always had that combination of work in the laboratory with the lecture work, and that in Chemistry has constituted a very complete course.

5046. Now that Chemistry is to qualify, will the arrangement in regard to examinations be on the same footing as the one you suggest as probable to be arranged in Engineering?—I cannot say.

5047. I mean, is that to be a development for the College as a whole?—I take it that it is, but perhaps

I ought to say that in the past the external Examiner for Chemistry has been—well, for the fifteen years I was there, I should say that for ten of them the external Examiner was the Professor of Heriot-Watt College, as a matter of fact.

5048. But it is with a view to getting at the essence of this co-ordination that I ask?—My idea is that for these advanced subjects, when the Heriot-Watt College students are candidates, that should necessarily be the case. It does not follow, however, that it would be so fully in Chemistry as it would be in Engineering, because the Chemistry for most of the Heriot-Watt College students would be in the first B.Sc., the Pure Science part, as it were, of their studies. Only in the case of those students whose Science was for application to chemical work—there I should certainly say the Professor should come in, and I should be disappointed if it was not so arranged.

5049. There are two points arising out of that. First of all, there is the question which has been raised in regard to the development of Technical Schools in relation to University Colleges—that of rivalry, of overlapping. What is your experience in regard to that?—I do not think there is likely to be any difficulty of that kind, in Edinburgh, at any rate.

5050. But where educational resources are very much less developed than in Edinburgh. I mean there is no sense of limitation of educational matters in Edinburgh, I think?—Well, you know, a very large part of this question turns upon how the Professors are paid—should they be paid by fees or should they be paid by salary.

5051. I want to get your opinion as to how this matter might be harmoniously worked out?—I should say that you would get no harmoniously, worked-out, conjoint arrangement unless all the members of the teaching staff were paid by salary. I do not mean to say that they would necessarily be influenced, but people would think they were influenced, and you will have implications of that sort. Personal interests will be said to be involved, and I should say that it is a necessary primary condition that the payments should be by salary.

5052. Both in the College and in the Technical School?—Yes, certainly.

5053. Mr. Justice MADDEN.—Is that so now in Edinburgh?—Yes.

5054. Professor LORRAIN SMITH.—You would be practically a University College if that scheme were carried out?—Well, we cannot be a University College. I mean that the Heriot-Watt College cannot be a University College in the ordinary sense of the term, because of the conditions under which it is managed. By these conditions it must be purely and simply under the management of the George Heriot Trust. But all the advantages of being a University College may, nevertheless, be secured.

5055. Mr. Justice MADDEN.—The College is not a University College, but a College utilised for University purposes?—That is the point, yes.

5056. Professor LORRAIN SMITH.—The point I was wanting to raise out of that is this: Do you contemplate anything as necessary to work out co-ordination, otherwise than in the way you have sketched?—I do not quite follow you.

5057. Is there a sufficient mechanism of co-ordination in what you have sketched to secure the harmonious and efficient working of the two institutions together?—I think the harmonious working of the two institutions, and the full utilisation of the resources of the two institutions can be worked out upon the lines I have indicated, without in any way interfering with the control of the Heriot Trust over the work done in the Heriot-Watt College or of the University, with the regulation of the standards of degrees. But I do not see how that could have been done if the members of the Board and the members of the teaching staffs of the two institutions had not been cordially at one in desiring to see the establishment of a complete and healthy Engineering Technical School.

5058. We quite gather that, but it is just this question of whether the interests of the two institutions, which are in a sense diverse, as you have pointed out, require any further united governing body, say, or anything of that sort?—I am afraid I am taking up a great deal of time——

5059. Mr. Justice MADDEN.—I am sure I speak the mind of all the Commissioners when I say that your evidence is most interesting; so please do not curtail it. —Well, the point is that a provision fortunately has existed for certain overlapping in the management of the two institutions. On the Board of the George Heriot Trust there sit two or three representatives of the University. On the University Court there sits one representative of the Town Council, and the Town Council is represented on the Heriot Trust to the extent of more than one-half. The Town Council forms one-half of the Heriot Trust, and it has a representative upon the University Court.

5060. Professor LORRAIN SMITH.—And further representatives in the Court of Patrons, and so forth?—Yes.

5061. You might elaborate that?—I mention only the University Court because it is the only court that has direct control of University arrangements, and that is the only Court to which this scheme, now under consideration, will go in the end, after being passed by the Senators. On the Board of Curators the Town Council is represented to the extent of one-half, but their influence in the University does not affect any question like this. Their sole power is the appointment of Professors. A large number of the Chairs in Edinburgh University are filled by the appointment of Professors by what are called the Curators of Patronage in the University. These Curators are three representatives, elected by the University Court, and four elected by the Town Council, so that the patronage of the Professorships in the University is very largely in the hands of the Curators; in fact, the Curators have about as many Chairs within their patronage as the Crown has.

5062. Mr. Justice MADDEN.—And in whom is the patronage of the Professorships in the Heriot-Watt College vested?—In George Heriot's Trust.

5063. How is that body constituted?—More than one-half are members appointed by the Town Council, and the remainder are appointed, two by the University, one by the Royal Society of Edinburgh, one by the Chamber of Commerce of Edinburgh, three by the School Board of Edinburgh, and two by the City Ministers of Edinburgh. The City Ministers were originally all members of the Board, but on the reconstitution of the Board their representation was diminished to two.

5064. And what is the tenure of office?—Three years.

5065. The Professors' tenure is three years?—I thought you meant the members of the Trust.

5066. No, the Professors?—I suppose they are removable on the usual notice.

5067. They are removable on notice?—I presume they are; but my view is that a tenure of this sort is a very long tenure.

5068. According to the constitution of the College, the Professors are appointed by the Trustees, and are removable by the same body?—Yes.

5069. Professor LORRAIN SMITH.—This union with the representatives of the University in the government of the Heriot-Watt College you regard as a most important element in the solution of the problem?—I do not think it would be a sufficient safeguard if there were any great difficulty otherwise. I mean that it is a very great assistance.

5070. Well, in proposing an arrangement will you make any suggestions?—You mean an arrangement in Edinburgh?

5071. Which would be a safeguard. In Edinburgh you say the circumstances are somewhat peculiar. Would you make any suggestions which would be a safeguard in making an arrangement to suit the case, which has been sketched to you, of a University College taking advantage of a school of Applied Science?—I should say that the school of Applied Science should have definite representation upon the governing body of the University—not a large representation. I do not in any way think that it would be necessary for the interests of such a College that it should have a mechanically efficient representation, so long as it had such a representation as would ensure that its aspect of any arrangement between the University and the College should be fairly put and fully understood.

5072. And also that the University College should be represented on the governing body of the school of Applied Science?—Oh, certainly. The advantage of the University being represented on the Board of the College is that the University is quite sure that it has a knowledge of the real facts of the case. That, of course, might be secured otherwise than by their having representation, but all that I think is necessary is, that there should be ample and not suspected information available at each Board as to the actual operations of the other.

5073. The general conclusion of this line of argument is, that some such mechanism is required in addition

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to the arrangement as to examinations, which you have described?—Yes.

5074. As a matter of detail, the Heriot-Watt College undertakes, I presume, certain courses in Applied Science—Chemistry, say—which are not in the University?—Yes.

5075. Does the University examine in the subjects of those courses, for any of the degrees?—It has in the past examined for the degree of B.Sc. in Electrical Engineering, students whose only knowledge of Electrical Engineering had been acquired in the Heriot-Watt College.

5076. And the same would apply to other subjects? That is why I have introduced another subject. Would it apply in Chemistry?—They have not given any degrees in Applied Chemistry. You see, there is in Edinburgh University no special degree in Applied Chemistry, and, therefore, that question has not arisen. It should be said, as a general principle, in the same way, that the one that has obtained in Electrical Engineering should obtain all round.

5077. It should be a general principle in regard to the school of Applied Science?—Yes, I think that ought to be.

5078. Dr. STARKIE.—Is attendance on these lectures in the Heriot-Watt College obligatory in these courses?—Yes; a candidate for the degree of B.Sc. in Electrical Engineering must produce a certificate of having attended a recognised course in that subject. The only course so recognised at present is that in the Heriot-Watt College, and, therefore, it is obligatory.

5079. Professor LORRAIN SMITH.—There are one or two other points I wish to put to you. It has been put before us that when a Technical College, such as the Heriot-Watt College, is in any measure absorbed in the academic world of a University, or a University College, it thereby loses that vital contact with industries which it is intended to have before it in educating its students?—I think it might be contended that that is quite possible, but I think it may be avoided. In fact, it should be avoided. Such an arrangement as has been made in the Heriot-Watt College will remedy that. It is a question of the character of the teaching. The teaching staff in the technical department, whether it is a separate College or whether it is part of the University, must, in my opinion, be in direct relation or connection with what is going on in actual practice.

5080. Must be in practice—as they put it in Medicine?—In practice, but not to the same extent as in Medicine; but in consulting practice.

5081. You spoke of a consulting engineer; would you apply that to the chemist?—Yes.

5082. You would?—Yes. The Professor of Chemistry in the Heriot-Watt College has been so consulted frequently.

5083. That is, to your mind, a sufficient guarantee that this academic aloofness will not come into effect?—Ah, that is a point I wanted to make; that there must be enough of the technical element in the College to make a circle, as it were, of influence for itself.

5084. In the whole University?—Well, to secure that there are enough men who are similarly related to technical work to make theirs an effective influence.

5085. It was rather that the whole mechanism for teaching divorced itself from the industry, and began to go off on lines which were not sufficiently practical—that was my impression?—There would be a danger, in my opinion, that must be most carefully guarded against, not merely in the constitution, but in the practice. I do not think you can guard against it by any regulation or anything of that sort; it must be done in practice.

5086. It must be done in practice?—Yes, it must be done in practice. But the rule in the Heriot-Watt College, which was established when its Professors were appointed—I being the first Principal—was, that they should be allowed to undertake a certain amount of consulting work, and it was my business, as Principal, to see that no Professor took so much consulting work—this being the danger that was apprehended—as to prevent him giving sufficient attention to his duties in the College. We, indeed, never found any danger in that way, or in the way of their taking too little.

5087. As a matter of administration, what salary do you offer to get a man who has sufficient professional position to secure consulting work, and who yet at the same time, will undertake teaching to the extent that you require?—Of course, when you say "you," I may take that to mean the Heriot-Watt College?

5088. Yes?—In the Heriot-Watt College so much of the work is evening work that Professors are expected to do a certain amount of evening work, and it is not, in my opinion, desirable to employ for that purpose a man who is no longer a young man. Therefore the salary which has been given hitherto is £500, and a man is allowed to supplement that. Afterwards, when he becomes more valuable in his profession, he goes elsewhere, and the Heriot-Watt College then has to look out for another equally promising young man. But where you have to face the question of day work only, or of day work predominating—it is an advantage to offer a higher salary, for there it is desirable for the institution to get as good a man as you can—a man with experience, as well as the energy of youth, and, therefore, the salary—well, take the salary given to the Professor of Engineering in Edinburgh University; it is £800.

5089. In Medicine it works out in this way, that a man who has this position gets consulting practice to such an extent that in some cases it is deemed worth his while to take the department for a nominal salary?—Yes.

5090. I understand that in some Colleges the Professor has less than the demonstrators?—I would not approve of that at all for practical work. I think the College must be able to have the first call upon the services of the Professor, and the first call upon his interest. Therefore I think his salary ought to be at least one-half of his income—more than one-half of his income.

5091. I notice that in Birmingham, in the Return we have, they offer £750 to the Professor of Applied Chemistry?*—That is just about the salary required.

5092. And £1,000 a year to the Professor of Engineering?—That is quite right; that is very much like the £800 in Edinburgh—the same sort of thing.

5093. You spoke of Professors doing both morning and evening work?—Perhaps I might just add, as appertaining to this subject, that the first Professor of Engineering in the Heriot-Watt College was Professor Beare, who went from there to the University College, London, and from the University College, London, he has come to the Edinburgh University; so that, I mean, the passing of young men away from the College is quite a part of the programme.

5094. You spoke a moment ago about Professors teaching morning and evening classes?—Yes.

5095. Do you find that a man is capable of doing both morning and evening teaching effectively?—Of course the work is so arranged that he does not do more than a day's work in any one day between the two.

5096. What do you call a day's work?—That differs very much. I should not like to fix a certain number of hours at all; I prefer to use my own judgment as to the nature of the work; it depends upon what work is being done in the classes.

5097. Various witnesses have put before us the essential importance of research work?—Yes. I think that is of the utmost importance—not merely that the students ought to see and perhaps take a minor part in research work before they leave any such institution, but that they should have the feeling that this is going on in the institution, and is of the utmost value, so that they get to know about it. We are now thinking of students who are to be leaders of industries, and they ought to realise what research work is.

5098. Did you make no special provision for research work, or did you contemplate that in allocating the amount of teaching a man is to do?—We contemplated that there, yes, certainly. That is why I say you have to consider each case in its own way. For instance, take a very good case of this kind. Professor Perkin was Professor of Chemistry in the Heriot-Watt College. He did a large amount of research work, which may or may not lead to important developments. He worked in the laboratory a very large number of hours; he had students in the laboratory during practically all that time; he was not continually attending to the students or to his own work, but he was doing both, and one has to consider in each case the arrangements necessary.

5099. But you did contemplate that as an essential part?—Yes.

5100. One witness spoke of a man teaching thirty hours in a week, and also expected him to do a good deal of research. My impression was very different from his. I thought he was putting a burden on the man which he could not bear?—I do not think I would expect any man to be more than thirty hours a week in the College, whether he was doing the one thing or the other, day and evening work together.

* See page 318.

5101. That would be very much more according to my idea. Another point is the general culture which is secured by the preliminary to the Applied Science course. I want to ask you about that. How wide do you make the Science there: do you regard it as necessary to restrict the preliminary work to Pure Physical Science, or would you include such a subject as Biology?—Students before entering the Heriot-Watt College have been taught Elementary Pure Mathematics, and so on. They have had literary work, so that they can write a proper description of anything in English. They have also had some work in translating from a Modern Language. When such students enter for a first year's scientific work I would include Physics, Chemistry, and Mathematics. The Mathematics now, however, will come on as practical. Pure Mathematics would be taught by somebody who has a definite understanding of the way in which it is going to be used by these men afterwards. Probably many students might be induced to take Geology.

5102. Fault has been found with the course in Biology, and I would wish to have an expression of opinion from you on the educational aspect of this question, whether it widens a man's outlook—whether that would be secured by teaching him some Biology?—Certainly, in my opinion, Biology, in some shape or form, is an eminently desirable subject, and I should like that most of these students should have had some of it, probably in the form of Botany, in school, but I don't think their time is so free when they are at a University that Engineering students can afford to give enough of time to Biology to get by it a really wider outlook. A little of it will not do that, and I would rather that they should take up Geology, which offers sufficient prospect of practical utility to induce them to make a sufficient study of it.

5103. To make it of real educational value?—Yes.

5104. I quite follow you. Have you had any experience of commercial education in the strict sense of the term?—Yes. I think we had in the College classes, perhaps, one of the most fully-developed cases of higher commercial instruction for those engaged during the day at work. There are, in every modern Technical or Commercial School, evening classes in which such subjects as Modern Languages, Shorthand, and Book-keeping and so on are taught. That goes without saying, but what I would draw your attention to in the Heriot-Watt College is the existence of an advanced type of class. There is a series of classes which provide instruction for men who have had four or five years' training in the best offices, such classes as those in the practice of Commerce, Commercial Law, Economics, Commercial Geography, Banking, Accounting, and so on. The type of teaching in these classes is practically of such character that a man cannot benefit by it unless he has a good knowledge of the work in a good office, and is old enough to appreciate the inter-relations of different sections of commercial facts. It means practically that the man is from twenty to twenty-four years of age, and has had opportunities.

5105. What measure of success has this Department had?—A very great measure. At first, it had to feel its way, but very rapidly it has improved, until now the numbers vary according to the class from thirty to eighty.

5106. Mr. Justice MADDEN.—Are they to any extent University students?—Well, that Department is not really represented in the University.

5107. Is there any connection between that side of the School and the University?—None.

5108. Do you think there should be?—These are evening classes.

5109. Professor LORRAIN SMITH.—How long has it been in operation?—Commercial teaching has been in operation all the time from 1820, but the higher classes of which we are now speaking have been in operation since 1888. They began then by a "Practice of Commerce" class. That class has gradually shed off one subject after another. The "Practice of Commerce" at first included the whole, but now it has become specialised.

5110. Is it desired by those interested in this subject that the University should give a degree in Commerce?—The subject is one of considerable discussion. Certain people do press that the University should give degrees in Commerce.

5111. That question is likely to be raised before us, and if you care to express an opinion I am sure we will be very pleased to hear it? Of course you will have a free hand in the matter?—My personal view—I don't hold it very strongly——

5112. I am sure we will be very glad of your opinion?—Well, I don't hold it very strongly. I have not threshed out the subject thoroughly because it has not yet reached that stage, but I think that in Edinburgh a great deal might be done by strengthening certain subjects of a commercial bearing, and the inclusion of these in the ordinary Arts curriculum. The Arts curriculum for the ordinary degree requires a man to pass in seven subjects.

5113. Mr. Justice MADDEN.—Are some of these optional subjects?—Yes, but there are restrictions to the option. He must take up one of this group and one of that group, and so on. That is laid down by the ordinances, and, therefore, it would require a great deal of pressure to alter it. If one were free to alter it, probably it would meet the case if certain commercial subjects were developed, and if certain restrictions as to the grouping of subjects for Arts degrees were removed. I hold that, because I think that if a man goes into Commerce with certain social advantages it is not necessary that his preparation should be purely technical and commercial, and it would be just as well if it brought him into line with other men of liberal education. It would be more to his interest to have a certain amount of ordinary Arts teaching, along with a certain proportion of commercial work.

5114. Professor LORRAIN SMITH.—There is a lower grade, if I might so call it, in a sense, a lower grade certificate or stamp, in the shape of a diploma, from the Chamber of Commerce in a commercial centre. That, I believe, is in force in London?—Yes; it corresponds pretty much with the diploma that the Heriot-Watt College has been giving in commercial subjects.

5115. The College does give a diploma?—Yes.

5116. Does not that meet the case?—No; it is a different thing. A commercial diploma is a technical diploma, pure and simple, with a minimum of general literary culture, and one which aims at securing adequate preparation in what might be called the technical aspect of Commerce.

5117. How many years does it take to get this diploma?—It depends on the facilities which a man has for instruction. It might take five, *i.e.*, five years of attendance at evening classes.

5118. Suppose a man goes to these classes and devotes his whole day, how long would it take?—He wants much more because he is not in any office. This five years is five years' evening classes, plus five years' office work. The College does not give a diploma for day class work without office work. I do not believe in a diploma in Commerce any more than a diploma in technical work without a certain amount of practice outside.

5119. The arrangement I have in my mind is this, that a man going into what was formerly the apprenticeship should take, say, a couple of years or whatever may be found necessary, and be taught the subject by expert teachers; then he should be allowed a certain time in his apprenticeship off because he has the diploma, and then he could go on to office work in these conditions?—The preparation you want would not require more than one year in addition to the preparation which a student has in a Technical School, but I would not give him a diploma for that. I would keep the diploma until after he has gone to an office, and then let him come up for examination. I would not give a commercial diploma to a man who knew nothing except what he was taught in a class.

5120. How do you manage to get men sufficiently in touch with commerce and yet willing to teach?—That is most difficult. The best men are induced to take up the work by their interest in it. Such men are generally too well off to care very much about the salary, but the College insists on paying them a salary, and then they feel bound to recognise that they have got to do the work. The crux of the whole thing is that good men must be secured or the students won't come.

5121. How did you secure such men?—By their public interest. The man is generally a man of light and leading in his department, whose authority is recognised at once by those engaged in the subject, and is known to the students who attend the classes.

5122. Dr. STARKIE.—Do you think it desirable that this commercial training should be commenced in Secondary Schools?—To a very small extent it should. In Secondary Schools it should include a sound knowledge of Commercial Arithmetic, which implies that the student is taught the general character of the transactions which are dealt with in Commerce. It is necessary to have in the higher classes for teaching Arithmetic some one who can tell the students more than they

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are generally taught about the meaning of the terms used. They should receive a general outline of the nature of the transactions involved in mercantile pursuits.

5123. At what age do you think it desirable that that sort of instruction should commence?—From about fourteen to sixteen. Commercial Arithmetic is not the only thing which I think should be taught. Book-keeping and Geography should be taught with special reference to the commercial system. That point should be kept in view in the teaching of ordinary subjects. They should be taught from that aspect.

5124. Do you think it desirable in Secondary Schools, or Intermediate Schools in this country, that such a subject as Geography or History should be divided into alternative courses—a General History course for general students, and Commercial History for those who intend to spend their time in commercial offices, and to treat Geography in the same way?—I will answer your question best by this: In the leaving certificate examination conducted by the Scotch Education Board, the examination is arranged so that in these subjects there is a choice of questions. The teachers on the commercial side may teach from the one aspect, and those on the classical side may teach from another aspect, and the pupil is free to select the questions which he will answer according to the side which he has been taught. There is a sufficient number of questions set for this purpose. In Scotland the direction of Secondary School teaching is secured only through this leaving certificate examination, and the inspection accompanying it. There is no programme.

5125. There is no general examination for the schools as there is in Ireland of the Secondary Schools?—This is practically a general examination of the product of the school work.

5126. But it is conducted in each school separately?—Yes, but there are general papers. The paper is common to all the schools.

5127. On the result of that paper the leaving certificate is given?—Yes, on the result of that paper, taking with it, however, the result of a general inspection of the school.

5128. I suppose the inspector has to pass the class before the class is qualified to be admitted?—Yes; in these subjects he has to report on the class teaching, not on the individual pupils, but he has to do so in certain other subjects. If the classes in a school are not satisfactory, the students will not be allowed to take the papers to qualify for a leaving certificate. The best case of that is modern languages, which form a scheduled part of the commercial classes in Scotland. If the teaching of modern languages is not satisfactory when the inspector visits the place, then candidates are not allowed to sit for examination.

5129. At what age do students enter for these day classes of the Heriot-Watt College?—About sixteen or seventeen.

5130. I gather from what you say that the great majority of them come from Secondary Schools?—Yes; they have either to present leaving certificates, or pass a pretty stiff examination.

5131. You don't find there are many who come from Evening Continuation Schools or Primary Schools?—A great many come from the evening classes in the Heriot-Watt College, but these have either had a leaving certificate before they went into their apprenticeship, or they began in the evening classes in the Heriot-Watt College or elsewhere by working their Secondary Education up to the standard.

5132. Have many of them who attend the evening classes been in Primary Schools?—Yes, many of them; but those who have been pupils in Primary Schools and nothing more have in all cases, you may say, completed their preliminary education by work in the evening classes.

5133. In Evening Continuation Schools?—Yes, or in the Heriot-Watt College.

5134. At what age would the lads be in the evening classes?—About fifteen years.

5135. There is a gap of two years from the time they leave the Primary School?—If so they may have been at Evening Continuation Classes.

5136. What I want to get is how in Scotland you would provide a ladder from the Primary School up to the University?—The boy does not go through the evening classes, except in very exceptional cases. There are cases, which I mentioned before, but they are exceptions.

5137. Do many of the lads in Primary Schools pass on to the Secondary Schools by means of Bursaries?—Large numbers. That is the normal method.

5138. In a part of your evidence you expressed the desire that the Engineering student should have the reputation of being, in a broad sense, an educated man; do you consider that the present arrangements in Scotland are likely to enable you to attain that aim?—I think that they will lead to that.

5139. In Scotland I understand you do not require from the Engineering student a course in Arts after he enters the University, but that when he passes the entrance examination he can abandon his general education to a great extent, and devote himself to special study?—I think that one defect in the Engineering curriculum in the University is that they do not make a modern language necessary.

5140. You would provide for it in that way?—Yes; but, at the same time, I think that a young man generally gets a good deal of liberal literary education before he goes to the University at all, and then there is the continuation of the influence of meeting and discussing matters with other students.

5141. You think, then, it would be sufficient in this country if we instituted leaving certificates, such as they have in Scotland or Germany, testifying to Secondary Education of a high type, such as passing through the Middle or Senior Grade, and that would be sufficient Arts training for a student who intended to devote himself to a practical profession?—I think it would.

5142. But it has been urged upon us by a number of very important witnesses that in the reconstituted College of Science in Dublin there should be a sort of co-ordination with the University such as you say exists in the case of Edinburgh and the Heriot-Watt College, and these witnesses have urged upon us the desirability of requiring from the University students a year in Arts before they do any practical work, and subsequently a year in Pure Science in the University College, and that only at the end of the second year they should take up the practical course in the College. Do you consider that would be an undue waste of time, or do you consider that it would be more likely to produce broadly-educated men?—I should think in the end the first year in Arts would come to be represented by the last year at school.

5143. If it were represented by the last year in school it would save a year. As to the first year of preliminary Science, that appears in all Engineering courses, but it is generally accompanied by a certain amount of practical work. Would you recommend that?—Yes, if it were only that the student might realise that he has begun his professional study. I think that to set out with a first year in Arts, a second year in Pure Science, and then a three years' Engineering course, would strangle the whole thing, and that you would get no students.

5144. Don't you think there would be also an objection to duplicating that first year in Pure Science, because in the College of Science, Dublin, there would be a number of students who would have no ambition to get a University degree, B.Sc., and for them it is necessary to go through a course of Pure Science before the practical work, and if the University students had to go through the course when they entered the College, don't you think there would be an unnecessary duplication of this work. Would it be possible for a University student to take the whole of his scientific course in the College of Science?—Certainly, it would be more desirable. The difficulty is one that has been arranged for in this combination of Heriot-Watt College and Edinburgh University.

5145. Professor DICKEY.—We may possibly have before us the result of the present negotiations before our labours have concluded?—Yes.

5146. What form will they take?—A joint agreement.

5147. Dr. STARKIE.—Does the Engineering student attending the Heriot-Watt College take the whole of his course there, or does he take any of it in the University?—He will take a portion of it in the future in the University, that is possibly by reason of the convenience of situation.

5148. Professor LORRAIN SMITH.—They are very close to each other?—On opposite sides of the street.

5149. Professor DICKEY.—That is the first question I was going to put. The University people can utilise to the fullest extent the Heriot-Watt College, and consequently also, it is to the mutual benefit of both institutions that there should be the closest and most cordial relationship established?—That is so.

5150. The Heriot-Watt College has no relations with the Universities of Glasgow, Aberdeen, and St. Andrew's?—It is exceptional to have any relation with Glasgow, and they never have any with Aberdeen.

With Glasgow the case is a man finishing the Heriot-Watt College course goes to Glasgow, and wants to take up, say, ship-building. It is of importance to him that his work in the Heriot-Watt College should be counted towards his Glasgow degree, and that has been arranged for.

5151. Glasgow is a great commercial centre, different from Edinburgh in that respect. I suppose, therefore, there will be some such institution as the Heriot-Watt College instituted if it is not already in existence?—I understand that you are to have Mr. Stockdale, of the Glasgow and West of Scotland Technical College, as a witness, and he could tell you as to this.

5152. Suppose you were establishing the Heriot-Watt College just now, would it not be desirable to establish from the beginning the close relationship with the University which you now propose to establish?—If we were starting it now, I suppose so. When starting fifteen years ago circumstances would not have made it desirable. It was not desirable at that time.

5153. Mr. Justice MADDEN.—That was owing to local circumstances?—Yes.

5154. Professor DICKEY.—That is the case in Belfast. They are starting a large Technical School of that nature, and it would be most desirable to have close relations established with the adjoining College?—I think it would be very desirable.

5155. Is there anything in Edinburgh like a private School or College of University Education outside the University?—In Medicine there is a very large extra mural school, which has been one of the largest factors in the great development of the Edinburgh Medical School.

5156. Apart from Medicine, is there any such establishment?—No.

5157. The reason of that is, Edinburgh does not give a degree except to students of the University?—That is so. There are plenty of tutors.

5158. But you have no rival institutions?—The qualified teachers in the extra mural School of Medicine are men whose classes qualify for classes in Medicine.

5159. The Professors in Edinburgh University have not to compete with outside institutions?—In Medicine they have.

5160. Except in Medicine. The circumstances are altogether different in Ireland. The Royal University, here is a purely examining body?—Like London, I understand?

5161. Like what London was. No one College is recognised more than another, so that a private institution largely of a grinding character has as much recognition as a College, so far as the presenting of students and the examinations are concerned. You cannot have anything like that in Edinburgh?—No. Where extra mural teachers are recognised in Edinburgh—and, in fact, before these classe in Heriot-Watt College were so recognised—the University authorities satisfy themselves that the College is sufficiently equipped with all illustrations for practical work, and all that sort of thing. That certainly does not hold with a number of private institutions, and they think a great institution, well equipped, is prepared to give more than a mere cramming instruction.

5162. Have you been doing a great deal for Agricultural instruction in Scotland?—Yes.

5163. Had that a large effect on the state of agriculture in the country?—Yes, it has in many ways; but the full development of that is so recent that it is not possible, yet, to point the finger definitely in the matter.

5164. There is an expectation that it will have a very beneficial effect?—Yes; already it has shown much promise.

5165. I suppose there are no special Commercial Schools in Scotland under the Department?—Each of the Secondary Schools professes to devote a considerable amount of attention to it during the last two years of the course, and some of them make very good provision for it.

5166. But it is not an organised system?—No.

The Witness withdrew.

The Most Rev. Dr. KELLY, Lord Bishop of Ross, examined.

5167. Mr. Justice MADDEN.—Your lordship has for some time past taken an active interest in higher education in Ireland?—Yes.

5168. We had the advantage of your evidence at the Commission of Inquiry, a couple of years ago, into the Intermediate Education system?—That is so.

5169. If I recollect rightly, you told us then that you had been engaged in teaching for some time?—Yes; I had been engaged for twenty years in teaching an Intermediate School.

5170. Have you given special attention to the question of Agricultural Education?—Recently, yes.

5171. You are aware that we are dealing with that question in its relation to University Education?—Yes.

5172. That is to say, so far as it may lead up to or be connected with or co-ordinated with University Education?—Yes.

5173. In giving your evidence, no doubt you will bear those general observations in mind?—I will endeavour to do so.

5174. Perhaps you will now, in your own way, give us the benefit of your views on this subject?—I propose at first, to call the attention of the Commission to the condition of agriculture in the country, in order that you may be better able to judge what are the needs of Agricultural Education, and thus to see how best it may be fitted in with University Education. The education in the University may trickle down the various grades until it reaches the working farmer; but on the other hand you must consider the condition of the working farmer and the condition of the various classes, in order to see what education will suit them. I don't propose to give the Commission a very big dose of statistics, but it is necessary for my argument to call your attention to agricultural statistics in a general way. I am sure it is within the knowledge of the Commission generally that tillage, as distinct from grazing, has been very much on the decrease in Ireland, and I have taken the figures. The number of acres under wheat has fallen away, between 1855 and 1901, to one-tenth. The number of acres under oats has fallen to less than one-half. The decrease in barley has not been so great. Barley belongs to what I may describe as an industrial crop, and the decrease in barley has been 30 per cent. The decrease in peas and beans is shown by the number of acres falling to one-seventh, and the result in the total of all the cereal crops is that the decrease from 1855 to 1901 has been 53 per cent. The decrease in the cereal crops has been greatest. There has been a considerable decrease in the potato crop; but that decrease has only been about 30 per cent.; and in the matter of turnips, mangolds, and other plants, which constitute green crops for fodder purposes, the decrease has been only slight—some 10 per cent. The total number of acres under tillage in 1855, was 4,276,000, and in 1901 it was only 2,397,000, so that, roughly, the number of acres has fallen to one-half. There is another aspect of the case that impresses me much more seriously than the falling off in the total acreage, and it is this: the produce per acre has not increased in any way except that of turnips and mangolds. The produce per acre has gone up in these crops. The farmers seem to have got hold of a better method of manuring and producing those crops, but in all the other crops produced there is not one which has gone up in yield per acre, but, on the contrary, all have diminished. In contrast with that is the state of affairs in Belgium, where I have been recently. This book, which I hold in my hand, is a publication of the Ministry of Agriculture in Belgium. Speaking generally, the acreage under cereals in Belgium is exactly the same, at present, as it was in 1846. This book deals with the figures between 1846 and 1895. It was drawn up last year, but the figures only come down to 1895. Speaking roughly, there is very little change in the number of acres under crops, but there is a most substantial change in the produce per acre, and, therefore, in the total produce. The produce per acre in wheat has increased in the proportion of from fourteen to nineteen. This book is calculated in hectares. A hectare, I need not inform you, is about 2½ acres. While the number of hectares has fallen somewhat in the wheat crop from 233,000 to 180,000, yet, owing to the improved methods of cultivation, the produce has increased from 338,000 to 348,000 tons. In rye the acreage remained identically the same, but the produce has increased per acre in the proportion of thirteen to seventeen, with the result that the total produce has gone up from 385,000

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tons to 506,000 tons. The produce of barley has remained about stationary. The produce of oats has increased in the proportion of fourteen to seventeen. Flax has remained stationary, but there has been a most extraordinary increase in the industrial crops of tobacco and beet root. In 1846 they produced only 1,227 tons of tobacco, and in 1895 they produced 4,560 tons. In beet root the acreage has multiplied itself by twenty-six, and the produce has gone up from 75,000 tons to 1,715,000 tons. There has also been an extraordinary increase in the fodder crops in Belgium, that is, in mangolds and turnips. The acreage in mangolds has multiplied itself by ten, and the produce per acre has increased from 12 tons per acre to 18 tons per acre, and the total produce from 127,000 tons to 1,814,000 tons. The increase per acre in turnips was in the proportion of ten to eighteen, and the total produce—the acreage slightly increased—the total produce increased from 1,129,000 tons to 2,572,000 tons. I wish specially to insist on the point of the increase of the produce per acre; and I distinctly say, as far as my knowledge goes, that there has been no increase in the produce per acre in those crops in Ireland, while you have that very great increase in Belgium. Now while our tillage acreage has decreased, the number of live stock has naturally increased, in Ireland. There has been an increase of 3 per cent. in horses, 31 per cent. in cattle, 21 per cent. in sheep, and 3 per cent. in swine; and the most satisfactory increase in Irish agricultural affairs has been in poultry, in which the number has more than doubled, having gone up from 8,000,000 to 18,000,000. While, however, we have had these satisfactory increases in live stock I wish to call the attention of the Commission to the fact that the decrease in price has more than counterbalanced the increase in numbers.

5175. Most Rev. Dr. HEALY.—The decrease in value?—The decrease in the price or value of the live stock sold. I take the figures from Thom's Directory of the prices at the great fair of Ballinasloe, and the figures run from 1880 to 1899 for twenty years, and taking the average price of oxen and heifers at Ballinasloe, which are divided into four classes for the four years, 1881, 1882, 1883, and 1884, and taking the tot of all those prices together—there is a slight difference in the decreases in the various classes of stock, as the decrease per cent. in the prices ranges from twenty to thirty-six per cent., but taking the tot of the price of the various classes of stock for the first four years, and also taking the same tot for the last four years, we find that the price of cattle has decreased exactly thirty-one per cent., that is, in nearly the same proportion as the number of cattle has gone up from 1855 to 1901. The increase in sheep for these fifty years has been twenty-one per cent. and the decrease in price has been close on thirty per cent. The net result of all this is that the total income from Agriculture in Ireland at present is substantially less than it was twenty years ago. I am not able to compare the price of cattle fifty years ago. I have not the figures. Now, it may be asked, why is it that, while agricultural produce has gone up so much in Belgium, it has remained stationary in Ireland? I have no hesitation in saying that it is owing to the want of agricultural education. In Ireland our farmers have continued to farm mainly by the experience they have derived themselves and the experience they have derived from their neighbours and their forefathers. One of the writers on this subject has stated that they farm by rule of thumb. The whole world, so far as I know, farmed by rule of thumb up to the last thirty or forty years, but some forty years ago the great German chemist, Liebig, suggested that the Science of Chemistry should be applied to the soil, that the soils ought to be analysed, and that the amount of nitrogen, phosphorus, and other elements in them should be determined; and he also laid down that the crops, wheat, oats, barley, potatoes, and fodders for cattle, should be analysed, and the amounts of those elements contained in the crops noted, and then that they should apply to the soil a chemical manure that would supply all the elements needed by it to produce any crop that was required. This discovery has revolutionised farming over a large portion of the world, but in Ireland very few people have yet got hold of that simple principle. Then he continued his investigations, and he found that, in the feeding of cattle, the class of food should be such as contained the proper constituents. If you wanted to produce butter you should adapt the food of the cattle to butter; and if you wanted to produce beef you should adapt it to beef. Well, all that is, up to the present, a perfect mystery to us in Ireland, and I have no hesitation whatever in saying that the great advance in produce in Belgium is due to the fact that the people in Belgium have got hold of this knowledge, and that we, in Ireland, if we are to save the country from ruin, must get hold of it too. Now, as far as my knowledge goes, the treatment of cattle in Ireland has not improved, any more than the treatment of tillage land; the produce of butter per cow is no greater than it was fifty years ago, the amount of beef we are able to produce on an animal of a given age, is no better than it was fifty years ago. I had a long conversation with a most intelligent gentleman, Mr. Ward. He is the Organising Secretary of Cheshire for Agriculture and Technical Education, and he told me that within his own recollection in Cheshire, dairy farms and cheese farms that could, as they say, carry only sixty cows, were now carrying ninety-five cows, and that the produce per cow, weight in butter or in cheese, was increased by about thirty per cent, and this result was arrived at largely by the use of chemical manures applied as top dressing to the grazing fields. He instanced one particular case, the case of the County Dairy School at Worleston. The county got possession of that some years ago. The farm then only fed thirty cows, and it now feeds fifty cows. As far as my observation goes a great part of the lands of Ireland are going back rapidly to the prairie state. No doubt, some of the richer lands continue to keep themselves in good pasture condition, but the greater part of the lands of Ireland, the poorer lands and the lands up the sides of hills require frequent tilling and manuring, or they go back to the state of wildness again. A great deal of the land has been overrun with furze, gorse, ferns and weeds; and even lands that do not present to the eye the aspect of deterioration, are in reality very considerably deteriorated. The farmers will tell you that the grass has become sour, and you will notice that when the cattle bite the grass and chew it, they find it sour and drop it from their mouths. You will see several fields covered with this chewed grass. The cows are grazing on them year after year, and the soil gets into a chemical condition unfit to produce the leguminous elements of grass, which are the most nutritious; and gradually the more acid plants get strength, with the result that the better-feeding grasses are crushed out, and the acid and bitter grass take their place. The quantity of hay or grass is diminished, but the feeding power of the grass is very much more diminished; and hence we badly require some information in Ireland as to the method of top-dressing those grass lands with chemical manures to counteract that process of deterioration. Now I come to consider how the light is to be spread in Ireland; and I may say to the Commission that within the last year or two I have given as serious thought as I could to this subject. I am a member of the Board of Agriculture, and it became my duty to consider the matter as carefully as I could. However, I must say my information is not sufficient to enable me to come to absolutely-determined ideas on the point, but I have fairly made up my mind. Now, I am aware your inquiry is principally in relation to agricultural education as connected with the University, but I wish to impress upon the Commission that this is a great national question, a question really affecting the very life of Ireland. In discussing this matter it seems to me that you will have to divide agricultural education into three or four separate classes. We require, firstly, a higher agricultural education, the principal tendency of which will be theoretical, investigatory, and speculative, and that education, in my opinion, would most suitably be given in a University.

5176. Do you mean in the direction of research?—In the direction of research. A University, as I regard it, is an institution where the whole tendency of thought is in the direction of pure, intellectual work—literary work or theoretical scientific work, and that the whole tone of thought is in the direction of pure intellectual development. Now, dealing with agricultural, and I may say the same of technological subjects, the aim is to develop the machine of the body to do its work in the most perfect way, to develop the hands and eyes and all the senses. The body is not to be used as a mere inanimate machine, but it is to be a body directed by a living and an intelligent soul, but yet the aim of the education is to bring the machine of the body to the highest mechanical perfection for the doing of its work, whereas in the University the principal aim is to educate the intellect, and you don't consider the powers of the body at all. And hence, from my point of view, Agricultural Education of the practical kind

could not be suitably given in a University, but we still require the higher class of Agricultural Education by which we shall produce scientists who will be able to investigate and make new discoveries, and will give some intellectual inspiration to all the lower classes. We then come to the real practical agriculturists, and here I must distinguish the thing into higher education, which will not be theoretical and speculative in the sense that I have already described, but which will be more practical—and, secondly, a purely practical education. We require some institutions where there would be a considerable amount of Science taught, but that Science intimately mixed up with practice, and those institutions would be attended, in my opinion, by the class of proprietors, by large and extensive farmers, and by men who wished to become teachers in the lower schools. And then we shall require later on lower schools that will bring the teaching into contact with every working farmer and farmer's son in the whole country. Now, I have said, I think, that the highest class of Agricultural Education ought to be in the University, and I look at it in this way. Geology, for instance, is an Agricultural Science. In a University a student who takes up Geology comes to deal with the fossiliferous soils, and from the tone of the University his mind goes on to investigate those fossils and how they came there, and what age they are, and a number of other speculative questions which are very interesting, and are useful as an intellectual exercise for a University student, but such questions would be of no importance to a practical agriculturist. The practical agriculturist simply takes the soil before him, and he sees what that soil contains, what crop that soil is fit to produce, and, if he wants to produce a particular crop, what element is that soil lacking in, and how can he supply that want. I say, therefore, I think there is a very considerable distinction between the theoretical geologist, and the practical agricultural geologist, and the same distinction occurs to me in reference to the study of Biology and Physiology. Suppose that there is an Agricultural Department in a University. Suppose the student is considering the crossing of the breeds of cattle. He naturally will be led off to see the effect of this crossing of breeds, and the change it makes in the species, and the idea will occur to his speculative mind whether he could go on crossing the breed until he produces a new species altogether, and he will enter on a very interesting disquisition as to the origin of species. That disquisition is not of much commercial value to the practical agriculturist; whose business is to see how he can cross the breeds so that his milch cows will produce a greater quantity of milk, and that the milk shall contain a greater number of degrees of fat, that the quantity of beef of his cross-bred may show an increase, and that the beef will be put up at an earlier age; that it shall be, if possible, put up at two years instead of requiring, as most of our animals at present require, four years. Therefore, I think there is, to a very considerable extent, an incompatibility between the education of the working agriculturist and the education of University men. Then, again, if you look at the culture which a University is supposed to give—to quote the words of a distinguished witness here, "the indefinable thing called culture"—it is, of course, desirable for a University man, or a professional man, and it will be very useful for a class of large landed proprietors and purely scientific men; but when you come down to the lower stratum of the practical agriculturist, that culture is entirely incompatible with his life. The man must be the horny-handed son of toil. He must be prepared to take hold of a plough or harrow, even though he is a teacher. He must be prepared to take hold of agricultural implements and show how to use them, and to go on tilled lands, to go into cattle byres, and into pig styes. He must be prepared to do all that. I don't think that is compatible with "University culture" in the ordinary sense. As far as I know these views will be borne out by what has occurred in England. The University of Cambridge, in 1890, took steps for Agricultural Education, on the invitation of Mr. Chaplin, who was then the President of the Board of Agriculture, and, in union with some of the County Councils in the neighbourhood of Cambridge, drew up some scheme. Finally, that scheme has fixed itself in the University, and is a department of the University at present, and the course is a two years' course, with a third year optional; and they have a University Professor of Agriculture, and University Lecturers in three or four other subjects.

5177. Mr. Justice MADDEN.—Does it lead to a degree or diploma?—It leads to a diploma in Agriculture. Then the University Professors in Chemistry, Botany, Zoology, and Physiology give agricultural lectures in those particular branches. Well, in the year 1900, they had only fifteen students in Cambridge University studying for the diploma. Seven of them belonged to the second, and eight to the first year. In the University of Wales they have done the same thing at the College of Bangor, and the College of Aberystwith, and in the Welsh University they give a degree of B.Sc. in Agriculture. The course for the degree is a three years' course, and they also give a diploma for a two years' course. Bangor College has a large farm in the Isle of Anglesey, and the Professor of Agriculture, Dr. Winter, lives on the farm. Well, for the degree of B.Sc. in Bangor they had only five students.

5178. How long has that degree been in existence?—I think about ten years.

5179. How many students were there for this degree?—For the degree, five.

5180. Most Rev. Dr. HEALY.—Five students who actually took it?—Five were studying for it in 1900. Of these, three were in the third year of their course, two were in the second, and none were in the first year of their course; so that it was a diminishing quantity.

5181. Mr. Justice MADDEN.—Do you know whether any Arts course is necessary, in addition to Agriculture, for that degree, or any Pure Science course?—They have a course in Science at the entrance examination.

5182. And probably an entrance Matriculation examination?—I don't think they are bound to matriculate in the same way as the other students. The University of Oxford, in 1890, made a move similar to Cambridge, and they put themselves in communication with the County Councils of Bucks, Oxford, Hants, Dorset, and Berks, and also some of the agricultural societies in England. There was a Joint Committee formed from all these bodies, and, by a decree of Convocation of the University of Oxford, there was established a diploma of Agriculture on a two years' course of study, with two years' additional residence and work on a recognised farm. After various migrations, the teaching has fixed itself at Reading College. They have there an Arts course. It is a Technical College, rather highly developed on the scientific side, and they have Wood-carving, Drawing, Modelling, and all that, very considerably developed. They have also there the British Dairy Institute Model Dairy, which was transferred from Aylesbury, so that they have the dairy on the spot now, as well as the agriculture. But the point I wish to insist on is, that Agriculture is brought into connection with all these other studies; and for the diploma in 1900, they had only nine students, and they had seven resident on the farm, going through their third and fourth year. They were more successful in Dairying and Horticulture. Then I should say that of the Agricultural Schools in England that are not connected with Universities, some of them have been very successful, while some of them have badly failed. I don't know them all, but I visited the one at Holmes Chapel, near Crewe. It belongs to the County Council of Cheshire. I found thirty students there, and the place very successful.

5183. Most Rev. Dr. HEALY.—Do they give a diploma?—They give some sort of a College diploma; not a University diploma.

5184. Mr. Justice MADDEN.—That seems to be an independent body, not connected in any way with a University?—Quite independent, not connected with any University, and simply worked by the County Council of Cheshire.

5185. Professor LORRAIN SMITH.—Do they not work it with the National Diploma of Agriculture?—Possibly they do.

5186. Mr. Justice MADDEN.—That appears to be the most successful institution in the United Kingdom that you have come across?—It is the most successful, as far as I know. In Belgium they have kept Agricultural education to a large extent separate from the Universities. They have a State institute for higher education, situate at Gembloux, which has no connection with any University. It was established by decree of the King, and gives diplomas.

5187. Most Rev. Dr. HEALY.—How many students are there?—The number has been growing gradually and uniformly. At present they have 104—that is in 1900. They began with 11 in 1861. In 1870 they had 61. In 1880 they had 83; in 1890 they had 117, and in 1900 they had 104. They have a very large farm attached. There is a magnificent building. It had

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been an old Benedictine monastery, which was confiscated during the French Revolution, and they have a very large farm of 150 acres, with a magnificent lot of cattle, horses, and pigs. Then they have a large garden, and they pay almost as much attention to gardening as to farming.

5188. Do you know what staff they have?—Yes. They have a Director and eight Professors, with some assistants and demonstrators. They have a Professor of Agriculture, a Professor of Rural Engineering, which includes draining land, road-making, building farmhouses, levelling, and all that class of thing; and they have Professors of Chemistry, of Zootechnic, as they call it on the Continent—including Anatomy, Physiology, and Hygiene—of Physics, of Geology, of Sylviculture, and of Rural Economy.

5189. But they have no connection with any University?—No.

5190. Mr. Justice MADDEN.—So far as you know, have many of the Professors received a University training?—Some of them have, and some of them not. That is the chief school for higher Agricultural Education for the *enseignement supérieur*. Then they have three State schools, two of those, at Kilvordes and at Ghent, are practically for Horticulture, and the third, at Huy, is an Agricultural School. It has only been recently established, and is not making so much progress. It has only thirty pupils.

5191. Most Rev. Dr. HEALY.—Would you call it Primary or Secondary?—Distinctly Secondary. In the gardening schools they have over 100. These are day schools, and the work is almost exclusively practical. There is very little theoretical instruction. Well, under those they have in Belgium a series of schools; they call them Intermediate Schools, but we would perhaps, regard them more as a kind of Higher Primary Schools. They call them *écoles moyennes*, but they don't reach the level of our Intermediate Schools.

5192. What would be the age of the boys attending those?—From twelve to sixteen or seventeen. In all those schools they have established a regular agricultural department, and they have at the head of that an ingénieur agricole, an agricultural engineer, who has a diploma either from Gembloux or from the Catholic University at Louvain, thus bringing the education into touch with the mass of people in the country. In Belgium they have an agricultural department in the Catholic University of Louvain, and it is a successful department, but the success seemed to me to depend upon special circumstances. The landed proprietors in Belgium generally belong to the Catholic party, and there is a very distinct line of cleavage politically—I am not speaking of religion—between the Catholic party and the Liberal party. The State College at Gembloux was supposed to be a Liberal institution, and, therefore, the landed proprietors of Belgium rarely went to Gembloux, but since the agricultural department was established in Louvain University, they attend in considerable numbers, and I was told that the effect from every point of view was excellent,—from the economic point of view, and the social point of view, and the religious point of view—because a number of these young gentlemen were doing very little good, as the saying goes, for king or country, but now they have got a University training, their minds have been directed to the work that they will have to spend their lives at when they come home to live on their estates, and they have become very much improved. Another class that have contributed very largely to the success of the department of Agriculture in the Louvain University are the clergy; for a very considerable number of priests in Belgium, after finishing their course in Philosophy and Theology, and being ordained, are sent up to Louvain by their bishops, and go through a regular three years' course in Agriculture, and take out their degree of agricultural engineer; and a very large number of the *écoles moyennes* are officered by those priests, who have their degree from Louvain University. And so, perhaps, in the contemplated University in Ireland, many of the students might come up from Maynooth, and take their degree in Agriculture. I think these two causes have largely contributed to the success of the Faculty of Agriculture in Louvain University. But I think there would be room for a similar faculty, and, to some extent, for a similar class in this country, though, of course, not quite to the same extent as in Belgium, owing to the circumstances of the country. So far, then, for what I regard as the highest class of agricultural teaching. Next, we come to the other classes of teaching. In my opinion, it would be very useful to provide provincial institutes, and I would venture to say that the Queen's College, Galway, could be far more usefully employed in that way than it is at present, and that it could be utilised for the larger class of farmers and for the training of teachers who would be afterwards wanted for the local Schools of Agriculture. I think there would be a very considerable field for it in that way.

5193. Would you have those provincial schools, say in Galway and Cork, of the type of the Gembloux establishment?—I don't think I would have them quite so high as the Gembloux establishment. I think a school of the level of the Gembloux establishment should be in Dublin.

5194. Is there any Arts side to the Gembloux establishment?—No; there is no Arts side, and at the entrance examination the students are not examined in Classics at all.

5195. Mr. Justice MADDEN.—You speak of it being in Dublin, I noticed in following your statements that the successful institutions seem to be in localities where there was a possibility of having a farm. I suppose you would regard a farm as bearing the same relation to a College of that kind as a laboratory bears to an ordinary Technical School?—Precisely.

5196. Does not that rather indicate the utilisation of such an institution as the Galway College for the purpose of a School of Scientific Agriculture?—Well, in Dublin, the Glasnevin farm could be utilised in connection with the higher teaching.

5197. Is not Glasnevin what I might call a suburban farm of rather limited extent?—It is a suburban farm of limited extent, but yet I think we would have there sufficient opportunity of bringing the young men into contact with actual work.

5198. Would your idea be to have a faculty, or side, of whatever College or University is established in Dublin, connected with the practical work at Glasnevin farm, and also to have a School of Scientific Agriculture of a different class in Galway?—Not precisely. My idea is you would have in the University a Faculty of Agriculture, and that that Faculty of Agriculture should be largely theoretical, and that, in addition to that, you would have in Dublin a College for higher Agricultural Education separate from the University faculty, and that those men would be taken to work at Glasnevin.

5199. That latter branch might very well form a part of the Royal College of Science here, which it is proposed to reorganise?—Certainly.

5200. And that might be co-ordinated with, and utilised by, the University so far as practical teaching went?—Yes; but I think it would be necessary that the young men in the higher practical School of Agriculture should not mix in the social life of the University. I think it would be necessary for their practical work afterwards that their ideas should be of a practical character, and they should not mix in the social life of the University.

5201. Most Rev. Dr. HEALY.—With the University students, you mean?—Yes.

5202. Mr. Justice MADDEN.—Are you speaking now of students whose careers would be those of agriculturists or of teachers?—Both those who will be teachers in the small agricultural schools in the country, and those who will be agriculturists themselves. I believe that for both it is absolutely necessary that they should be "of the earth, earthy," and you could not hope for that by mixing them with a class of purely scientific and investigating men in a University.

5203. Where would you get the type of the Belgian *écoles moyennes*?—I propose to have something higher than the *écoles moyennes* of Belgium. They deal only with the individual in his individual capacity, and therefore I think we want, in Ireland, something higher than that.

5204. But we should want that also?—Yes. We have a considerable want of teachers and itinerant instructors to spread the light in every direction. I propose that we should turn them out from Galway. I am not, of course, speaking for the City of Cork. I merely throw out a suggestion, and it is this: from my point of view, speaking as an Irishman interested in his country generally, I think that Cork Queen's College could, to a very large extent, be utilised as a Technological College. We have some factories in the South—very successful woollen factories at Blarney and Douglas; and there are other factories. If we are to develop the resources of the country we must train men to become manufacturers. We must train men to be contractors, and to do work in a large way; and I think Cork could, to a large extent, be utilised as a

Technological College for that. I believe that in Cork the citizens would be anxious to retain the Medical Faculty in the College. The Medical Faculty has been doing a considerable amount of work. There are a large number of medical men in the City of Cork, and there are rather large and well-managed hospitals in the city; so that I think the Medical Faculty can get on very well there. But I think that a large portion of the buildings and endowments, particularly the endowments of the Law Faculty, ought to be devoted to technical work. Of course, the Engineering Faculty there could not only be continued, but developed. My idea is that you should have what is on the Continent—not only Schools of Chemistry, but also schools for Spinning, Weaving, and Dyeing, and all those schools which you find everywhere on the Continent for the purpose of developing manufactures. Well now, we have to come to the popular schools. The first claim I would make as to the popular schools is to utilise the National Model Schools for this purpose. I may say that at a meeting of the Catholic Bishops held in, I think, February, 1900, to consider the passage of the Agricultural and Technical Education Act, amongst the resolutions, as far as I can remember, was one pointing out that the Model Schools should be utilised for the purpose of Agricultural and Technical Education.* In some places they might be made Agricultural Schools, and in others Technical Schools, according to the wants of the locality.

5205. Dr. STARKIE.—Some of these Model Schools are not in a satisfactory position to be used as Technical Schools?—They could be used as Agricultural Schools, and those in the larger towns, where there were any industries, would be used as Technical Schools. In Cork there is an agitation going on to get hold of the Model Schools for technical purposes. They have a considerable sum of money—their share of the £25,000, which was specially ear-marked by Act of Parliament for this purpose; and there is a school in Cork, the "Crawford" School, built for this purpose. But they are greatly cramped for room, and they have to crush into a hall four times as many students as the hall is built to accommodate; and so there is an agitation to get hold of the Model Schools. Then there is room for a technical section in the Queen's College, and there is room for the Model Schools as Technical Schools. We want a Technological College for manufacturers, for civil engineers, and for contractors of works; and that would be my view with regard to the portion of the Queen's College buildings and endowments which I would propose to appropriate. Then again, we have an enormous number of carpenters, blacksmiths, plumbers, shoemakers, and tailors, all of whom require an individual education, and that could be given in the lower schools.

5206. Most Rev. Dr. HEALY.—Arts and Crafts Schools?—Arts and Crafts Schools.

5207. With regard to the Agricultural Schools that would reach the individual farmers' sons—have you any suggestions to make?—Well, at present, owing to the lack of teachers it is quite impossible to have such schools—absolutely impossible—and I entirely agree with the opinion of Mr. Horace Plunkett, that we cannot undertake the work of education at present because we have not teachers. It will take some years. We won't have a supply of teachers till these higher schools are established. For the present all that can be done is to get a few peripatetic teachers to go around and give the farmers some practical hints. That might do some good, because they could tell the farmers to apply such and such manures for the production of mangolds, such and such for turnips, and so on.

5208. Mr. Justice MADDEN.—Do you find that the farmers are ready to take hints from peripatetic teachers?—They are quite ready, and not only ready, but they are actually longing for the education.

5209. That is a very encouraging fact?—Yes. I may tell you this, which may help to show the frame of mind of the people. In my diocese, for the last two years, I don't think there were five acres of potatoes left unsprayed. In the year 1900 the potato crop in Ireland, taking Ireland as a whole, was bad—one of the worst crops for eighteen years— but in all that part of Ireland, owing to the spraying of the potatoes, the crop was considerably beyond the average, and I went carefully into the calculation of the number of houses and acres, and satisfied myself that the spraying of the potatoes was, on an average, worth £5,000 to each parish. Well, they have done that, and I see no difficulty in getting people who have done that to treat their cattle in a different way from what they have been doing, if they are shown that it will be more remunerative, and in getting them to make any other changes that are pointed out to them. Of course, the character of the people in my diocese may be such that it is more easy to stir them up to adopt a new system, than it is in other parts of Ireland; but I think the same spirit is moving rapidly over the whole country, and that if we had a body of competent instructors we would, in a year or two, find plenty of occupation for them.

5210. I suppose you think that if in any locality there were a few progressive and inquiring farmers, who took steps to improve their land and cattle, the neighbouring farmers would soon see the advantage to be derived from scientific instruction?—There is no doubt about that.

5211. Is there any other matter you would like to bring forward?—There is only one other remark I should like to make. So far, in my opinion, are we from progressing in the study of these Natural Sciences, in Ireland, that we are really retrograding. When the Intermediate Act was first passed there was an effort made to introduce a Natural Science section into the programme. I think Dr. Molloy was the author of the idea—the idea that the programme should lend itself to specialisation in several directions: that some students should specialise in Mathematics, and others in Natural Science.

5212. From the evidence we have received from you and others, at the Intermediate Commission, and from evidence that has been given here, it is quite plain that that effort has failed—and we know why it has failed?—As a matter of fact, it has failed.

5213. I may also call your attention to the fact that the Intermediate Commission, exercising their powers under the new Act of Parliament, are doing all they can for the promotion of this object?—Yes. I merely wished to call your attention to the fact. I was able to lay my hand on only two reports—1888 and 1897—and in the report for 1888 it is stated that 3,700 boys passed in English, 2,000 in French, 1,691 in Natural Philosophy, and 805 in Chemistry. So that the number passing in Chemistry was about one-fourth of the whole. Now, coming to the figures for 1897, we see that 5,300 passed in English, 5,200 in French, only 308 passed in Natural Philosophy, and only 183 in Chemistry. Therefore, whilst the total number passing in English and French increased considerably in the course of ten years, the number in Natural Philosophy had fallen down to 300, out of 5,000, and in Chemistry only 183 out of 5,000; so that the conclusion is manifest that there is practically no teaching of Natural Science.

5214. It had practically died out. We need not go minutely into the causes. In your evidence before the Intermediate Commission you laid stress upon one branch of education—that is to say, Commercial Education. Now, have you anything to suggest on that subject in connection with University Education—I mean with regard to higher Commercial Education?—Well, that is a subject that interests principally the cities and larger towns.

5215. I know that you recognise the importance of the subject?—Distinctly. I held very strongly in my evidence before the Intermediate Commission that there should be a commercial side to the programme, and that that commercial side should be developed; that the same amount of awards and inducements should be given for Commercial Education as for the Grammar School course of education. I hold those views still. In connection with the Technical Schools of the new Department, I have been making every effort I could to get Commercial Education developed in the various towns. The Department has £30,000 to be expended in Technical Education through the rural districts of Ireland, that is, all the districts outside the six Borough Councils. That money has to be expended, and Technical Education includes Commercial Education. I do expect that Commercial Education will be developed in the towns. Then I myself, in my part of the country, gave an impetus to the establishment of Continuation Schools under the National Board; and I have insisted on the commercial portion of the programme and the Natural Science part of the programme being taken up. I have an idea that we shall be able to develop, out of these Evening Continuation Schools, schools for the education of the shop-keeping class.

5216. Most Rev. Dr. HEALY.—I have only one or two general questions to ask you. I should like you to sum up one or two of your conclusions. I take it for granted that the almost total neglect of Agricultural education in this country is one of the primary negative causes of the great diminution of the national wealth you have pointed out as having taken place in the last fifty or sixty years?—Yes; that is my idea.

* "The Irish Ecclesiastical Record," June, 1900, page 553.

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5217. The national wealth in Ireland is derived mainly from Agriculture?—Yes, and must, I think, for a considerable time.

5218. And, therefore, I assume that you will admit that the most efficacious means of augmenting the national wealth of Ireland would be by the development of Agricultural Education?—I am strongly of that opinion.

5219. It would be also the most efficacious means of stopping the tide of emigration, which most Irishmen admit to be a very great evil?—Yes. I have made public statements to that effect frequently.

5220. In view of the gradual extension of occupying ownership, I presume in the future there will be a greater desire to get an agricultural education, arising from the sense of security of tenure?—I think so.

5221. You are aware also that what they call grass-farming of late is not paying in the country?—I am fully aware of that.

5222. And from that I suppose we may infer that the people must of necessity turn their attention more to Agriculture in the future, and, therefore, that in the future there will be a greater need for Agricultural Education than there was in the past?—Much greater.

5223. Professor LORRAIN SMITH.—With reference to the University Higher Education in Agriculture, who do you think would form the classes?—The students I contemplate, should belong to the wealthier classes; and, of course, there might be some clever pupils who would come forward with County Council Scholarships, who would mount up from grade to grade, and get an opportunity of going through their University course.

5224. With regard to what you have said about the Scholarships, do you think that would be an important essential part?—Certainly.

5224A. Would you expect to get any considerable number of students who would engage in research from a mere love of Science to go through the University?—Well, I do not contemplate that, unless the clergy followed out the lines of the Belgian clergy. I do not expect that in the University Faculty of Agriculture you would have a large number of students.

5225. Even for a small number do you think you would have to offer inducements for them to attend the University classes?—Well, I think so. The farming classes in Ireland are quite unable to pay for University education.

5226. Dr. STARKIE.—You propose that there should be a technical department established in the Cork College?—I threw that out as a suggestion. As I remarked, I have no mandate to speak for the city of Cork at all.

5227. But at the same time you said that there was a demand in Cork for medical instruction, and consequently it would not be advisable to abolish the Medical School?—Yes. That, I think, is the feeling in Cork.

5228. As the technological department would require endowment, how would your lordship suggest that the increased expenditure of the College would be defrayed without the abolition of one or more of the present faculties? Would you propose that the Art School should be abolished?—That is a matter upon which I don't quite like to express an opinion. I don't know what the feeling of the people in Cork would be on the subject.

5229. The saving by the abolition of the Law course would be very small?—Very small. Then, of course, in addition to the portion of the endowment of the Queen's College the Technological College could be assisted from the borough, which has £2,500 from the Department, and would have £2,500 from the locality.

5230. I suppose you hold that before such a department could be established in the Cork College, it would be necessary to alter the constitution of the College in such a way as to satisfy the demands of the Catholics in Ireland. Up to the present one of the great reasons why the College in Cork has not been satisfactory was because it was deemed dangerous?—Yes. That is so.

5231. I suppose the same objections to the present constitution of the College would remain, even if it was mainly a technical institution?—Well, I see from the papers it seemed to be contemplated that the constitution of these Colleges should be changed.

5232. Have you any knowledge of Galway College—would you be in favour of abolishing the Medical School in Galway?—I don't know Galway very well, but I would be in favour of abolishing the Medical School in Galway, because I think it is too small for a Medical School, and the hospitals there are quite insufficient to give a proper medical education.

5233. Most Rev. Dr. HEALY.—You would substitute an Agricultural School?—Yes.

5234. Dr. STARKIE.—I would ask you, do you think there is any chance of farmers going and taking a course in this College, because we had evidence that there appeared to be no demand even in England for higher agricultural training on the part of farmers?—I think you would have a greater demand in Ireland than in England. I was very much gratified some time ago to find in England that the farmers were more narrow-minded, and self-sufficient, and self-opinioned than the Irish farmers. The farmers in England do not admit that their methods could be improved, and they take it as an insult that anybody should suggest that it was possible to improve their methods. I met, at a hotel in Bangor, a short time since, a large farmer. I questioned him on this matter of Agricultural Schools and improvement of methods, and he spent two hours ridiculing the notion that the Bangor Agricultural School could do anything of the sort. Similarly at Holmes Chapel; at first they ridiculed the thing, and afterwards, when they saw that the Agricultural School was doing good work, they would not admit the fact—and they would not go to see the place while the Professors were there; but some of them waited till the Professors and students were away at service in the church on Sunday, and then they went and examined the farm in their absence. Afterwards, when they had begun reproducing on their own farms what they had seen on the College farm, one of the Professors came round, and he said: "I did not know you carried on such-and-such a process here." "Oh, yes," was the answer, "It has been carried on here for fifty years." Still, I would not count upon a very large number of farmers going in for the higher education in Ireland at first.

5235. But your lordship knows that attempts were made not only by the Queen's Colleges, but by the National Board, to encourage Agricultural Education in the latter years of the nineteenth century?—I am quite aware of that.

5236. And the results of the experiments were by no means satisfactory?—Well, we live in different times altogether. If the prices that existed in Ireland from 1870 to 1884 had continued, I think it would be like a dog baying the moon to talk about Agricultural Education. But the shoe pinches at present, and the people are anxious to relieve themselves, and I think are amenable to improved methods.

5237. With regard to the Model Schools. I suppose you are aware that it does not rest with the National Board to decide about the Model Schools; but that legislation would be required before the National Board could hand them over to the new Department?—Well, I am really not aware of their constitution from that point of view.

5238. Professor DICKEY.—You gave us some interesting statistics relating to Agriculture for all Ireland: did you compare them for the provinces?—No; I have not compared the provinces, as I was dealing with all Ireland.

5239. Would your conclusions apply to all the provinces alike—take Ulster, for example?—Well, I think in the matter of the wheat crop they would apply practically alike to the whole country.

5240. What would you say as regards cattle?—The increase would, I suppose, apply equally to Ulster. Then, of course, the flax-crop has immensely diminished in Ulster. I don't think they produce barley to a great extent in Ulster.

5241. Practically your conclusions would apply equally to Ulster as to the other provinces?—I think so. However, I have not gone into that.

5242. Have you studied the question as far as it affects Scotland?—No.

5243. In speaking of the Model Schools, you recommended that they should be utilised for Agricultural Education?—Or for Technical Education.

5244. Does that apply to the Model Schools in Ulster?—As far as I know, certainly. I think they would be far more useful to the people of Munster and Connaught as Technical and Agricultural Schools than as mere literary schools. In the south and west they are not at present used for the National Education. I am quite aware they are used in Ulster, but, in my opinion, they would be infinitely more valuable to the people of Ulster as Agricultural and Technical Schools than as mere literary schools. I think it would be a great advantage to the Ulster people if they had their share of the £33,000 a year, which the Model Schools cost, devoted to teaching them scientific farming. The result would be immensely more valuable to them than the results of the literary training they are getting at present.

5245. Take Derry and Belfast, would there be any necessity for interfering with the Model Schools there?—I don't know what class of work the Model Schools are doing in Derry and Belfast.

5246. Then you don't know all the conditions as far as Ulster is concerned?—No. But the evidence before Royal Commissions distinctly shows that the Model Schools have not been doing as good work from the literary point of view as the common National Schools. It was the Report of the Royal Commission of 1868-1870 that, taking Model Schools as a whole, they were below the ordinary National Schools—that the teaching was very bad.

5247. I don't think that applies to Ulster?—That was the general decision on the whole of them. Then you will remember that there are more Model Schools in Ulster than in the other three provinces together.

The Witness withdrew.

HERBERT F. STOCKDALE, Esq., Secretary of the Glasgow and West of Scotland Technical College, examined.

Herbert F. Stockdale, Esq.

5248. Mr. Justice MADDEN.—You hold the position of Secretary and Treasurer of the Glasgow and West of Scotland College?—That is so.

5249. And you were previously Secretary of the Durham College of Science at Newcastle-on-Tyne?—Yes.

5250. We are enquiring into the subject of Technical Education, specially with reference to the University system. I am sure a good deal of the evidence you are prepared to give us about these Colleges will have a direct bearing on that subject. I only mention the limitation of our inquiry that you may bear it in mind in your evidence. What is the constitution of the Glasgow and West of Scotland College? The details of its endowment would hardly be of importance for the purpose of our inquiry; but the constitution and work done in relation to the University and University teaching would be of great importance?—The College is constituted under a scheme of the Educational Endowments Commission; and its direct connection with the University dates from the issue of the ordinances of the Scottish University Commission.

5251. What is that date?—I am afraid I cannot tell. The College course of instruction for day students extends over three years, and at the end of that three years they should be in a position to gain by examination the diploma of the College. Those who hold the diploma are Associates of the College and are eligible for admission to the B.Sc. examination of the University of Glasgow, after satisfying certain conditions. The first condition is, that they should pass the preliminary examination of the University; and after having gained the College diploma they must attend at least three courses of instruction in the University, of which one must be Engineering. If those three courses, together with the College course, are not equivalent to the ordinary B.Sc curriculum in the University, then they must take additional courses to make them equal.

5252. The course of training in the College is, to a certain extent, recognised in obtaining the degree?—Yes; I think that that connection with the University is a very valuable one, and is certainly one we much value. It fixes the standard of College instruction. But I don't think that avenue to the B.Sc. degree is of special value to our students. I think the principal reason of that is this: Our College course is directed towards training for certain definite professions. The University curriculum has a different object; consequently the courses vary, and are not exactly on the same lines. The University examinations are arranged on lines to suit the University courses, and consequently young men who have gone through the College course feel they are not on the same footing as University students; the result is that not many of our students go forward to the B.Sc. examinations after having taken only the three prescribed courses. As a rule, they feel obliged to extend their course; and I think the majority of our associates who get the B.Sc. of the University have attended at least two years in the University.

5253. State the course of instruction in your College, and the particular objects towards which it is directed?—The first year's course is practically common to all departments. The time given by different classes of students varies a little, but the first year's course is confined to Mathematics, Natural Philosophy, Chemistry, Drawing—Geometry, and Machine Construction. Engineering students give more time to Geometry and Machine Construction than to laboratory work. The Chemistry students give more time to the laboratory than to Drawing. In the second year course the students are divided into groups. The main groups are those intending to become mechanical or civil engineers, and those intending to become chemists. Naturally, the latter give more time to Chemistry; and largely in the second, and entirely in the third year, their work is in the chemical laboratory. In the Engineering group, for the first and second years the courses are more or less common.

5254. I don't think it will be necessary to trouble you with many details. You are pointing out very clearly the general course of the education, which is that, as time goes on, the students specialise?—Distinctly so, with the object of entering a given profession.

5255. And those professions are, generally speaking, Engineering in its various branches, and of Chemistry: are there any others?—Mainly Engineering in its different branches, and Chemistry.

5255A. The education in the College, I suppose, leads up to a certificate or diploma?—To a diploma. We generally speak of those who hold the diploma as Associates of the College.

5256. How many students are there in the College?—The total number is about 600, but that is misleading. Only about one-third of those are such students as I described, students who go through the College and give their whole time to College work for a definite period. Another one-third is composed of students who come from the local Training Colleges for instruction in Natural Science—elementary teachers. We have the laboratories and the instructors, and they find it a convenient arrangement to send their students to us for training. The other one-third consists of men who have been in works, and who feel that they would be very much better equipped for future progress in their occupation if they had more grounding in theory. They come to us for special courses in special subjects.

5257. Dr. STARKIE.—In the evening?—No. I am speaking entirely of day classes.

5258. Mr. Justice MADDEN.—Have you evening classes?—Yes—the largest in the country.

5259. How many evening students are there?—About 4,000.

5260. What is their position, speaking generally?—Well, they are engaged in the various industries carried on in the district. Speaking generally they represent every important industry.

5261. You have 600 day students?—Yes.

5261A. Of those 600, about how many annually take the degree of the University?—Well, sir, I think, probably not more than a dozen or twenty graduate in Science in Engineering in the University, and, roughly speaking, about half are students of the College.

5262. The College was constituted under a scheme of the Educational Endowment Commissioners by amalgamating three Colleges?—Yes. There were really five or six, but practically three.

5263. What is the existing governing board of your College?—There are representatives appointed by the amalgamated institutions when the amalgamation took place; and there are members appointed by public bodies, for instance—the City Council, the University, the School Board, the Institution of Engineering, and the Philosophical Society. Then there is a small number of co-opted governors, who took the place of life governors who have died.

5264. How many representatives of the University?—Two represent the Senate.

5265. On your Board?—Yes.

5266. And it consists altogether of how many members?—Thirty or thirty-one.

5267. Has your school any representation in the governing body of the University?—No, sir, not officially.

5268. What is the governing body of the Glasgow University?—The supreme body is the University Court.

5269. It corresponds, in that respect, with the University of Edinburgh?—Yes.

5270. I suppose it is constituted on the same general principles?—I think exactly the same.

5271. I presume that is under the University Act that was passed in 1889 or 1890?—Yes. The last Act.

5272. Have you a fully-equipped laboratory, with all the necessary appliances for teaching Practical Science?

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—We have a very good equipment; but our buildings are very unsuitable. We are proposing to do away with them, as they are entirely out of date. As a matter of fact, our buildings contain the first chemical laboratory ever established in this country. At the present moment we are busy with the plans for our new buildings.

5273. Is your laboratory utilised to any extent by students of the University, or has the University of Glasgow a laboratory and appliances of its own for teaching purposes?—It has just opened a very fine Engineering Laboratory indeed. It has other laboratories, of course, in Physics and Chemistry. I mentioned the Engineering one because it is a very fine one, and will be one of the best-equipped in this country.

5274. You have explained some of the relations between the School and the University. Is there any other connection between them?—That is the only connection—the recognition of the diploma of the College by the University, on the one hand, and our giving them a representation on our Board, on the other. I should not like to give the impression that one is a *quid pro quo* for the other, for the University were asked to appoint representatives because they were a prominent public body like the School Board, and the Town Council.

5275. You were, previously to your appointment to the Glasgow and West of Scotland College Secretary of the Durham College of Science at Newcastle-on-Tyne. Is that under the control of the University?—Only to a limited extent. The granting of degrees is under the control of the University. The College is entirely under the control of the Executive Council. It is incorporated under the Companies Acts. There is a very long list of governors—subscribers of £25, I think, and upwards; and that body appoints the major portion of the executive, but in addition there are representatives of public bodies.

5276. Has the Durham University any control?—To this extent: that the Executive Council must contain five members of the Chapter, or of the Senate of the University; and the Warden of the University is *ex-officio* President of the College.

5277. Then there is a connection between the University and the College?—Yes; and the University subsidises the College to the extent of £1,300 or £1,400 a year.

5278. What degrees in Science are given by the Durham University?—Bachelor, and Master, and Doctor of Science; and these are divided again. A man may take his degree in Pure Science, in Engineering, or in Agriculture.

5279. What are the relations between the Durham College of Science and the University—I mean to say, does a student of Engineering for the B.Sc. in Engineering reside in the Durham University?—It is not purely residential; it has residential Colleges.

5280. Does attendance on lectures in the Durham College of Science count towards the attainment of the degree in the University?—Yes; the degree of B.Sc. can only be obtained through the College in Newcastle.

5281. In fact, the Newcastle College is the teaching branch of the University as regards Applied Science?—Yes. And I should like, also, to state that the degrees in Letters of the University can be obtained through the College of Science in Newcastle also. That is a new department. The Faculty of Literature was instituted not very long ago.

5282. Is there anything else that occurs to you as useful for us to know, with reference to the connection between the Colleges and the University?—I think not.

5283. Professor LORRAIN SMITH.—You remarked that students who were Associates of your College very often stayed two years in the University before taking their B.Sc. in Engineering?—Yes.

5284. Why is that?—Because our students feel that they cannot safely come forward for the B.Sc. examinations if they attend only the three courses of study, which they require to attend under the ordinances. Probably the majority of graduates attend four years, but the official course is not more than three years.

5285. Is that because the University course is on a higher plane than the course in the Technical Colleges?—No, but because they are on slightly different lines.

5286. Do you regard it as desirable that they should be on similar lines?—I think not. I think that the Technical College has a more definite field of work. Our course in all the branches, in Chemistry, for instance, has a very direct reference to the work a man has to do when he leaves the College. I may tell you that last session, for instance, every student who had completed his three years in Chemistry immediately obtained a post in chemical works, or in some money-earning capacity, where his chemical knowledge was directly useful. I think that is hardly the end to which you would expect a University course to be directed.

5287. Is there not a very general opinion in favour of combining a University course with the course of technical knowledge, and do you regard it, from the educational point of view, desirable that they should be separated?—I think that if, in the University course of three years, it were attempted to include such a course of instruction as we give, it would not be satisfactory as a University course. I think our course of instruction in the College is too narrow for a University course.

5288. A distinction has been drawn between two types of technical institutions—the strictly technical, and the technological—the technological being less narrow, and more of a University type, and that the latter are demanded by some men who are likely to become traders and managers of industry—the latter being closely connected with University teaching, and the other more or less belonging to a different sphere. Would you support that view?—I think the history of our College and the men who have gone out from it, show that our training is the one—I do not like to say the best-adapted—but thoroughly well adapted to fit men for high positions in technical occupations. We have produced a long roll of men who hold eminent positions in different technical works.

5289. It has been pointed out by several witnesses that it would be very desirable that, in certain subjects of a technical character, men should be able to obtain the stamp of a University degree. What is your opinion on that point?—I think it would help us very much if our men could get a University degree on the course that they follow.

5290. But, then, you seem to think that the course of instruction given is hardly worthy of that?—I should not like to say not worthy of it, because the standard is high enough, but the course is not so broad, and cannot be so broad, as the course for the University B.Sc. degree.

5291. Would you regard it as a misfortune to attempt to broaden it—would it make a serious alteration of your arrangements to broaden it so as to make it really of a University stamp?—It would mean another year's course—a four years' course.

5292. That would mean?—I think that in our second year we should not begin to specialise in our course of study.

5293. Would that be too serious a burden for the students—four years?—Well, I am afraid one has to consider the competition that the College is subjected to. Other Colleges accept regularly a three years' course, and we are obliged to fall into line with them.

5294. You have considered competition?—Yes.

5295. In Edinburgh the Heriot-Watt School has come into very close relationship with the University?—Yes.

5295A. You have no similar movement?—I don't see how we could have. The conditions are different in the two cities. The Edinburgh University has not a first-class laboratory. Certainly it cannot have a laboratory equal to that which Glasgow University will have in a few years.

5296. Their idea seems to be that they should have complementary laboratories?—Yes.

5297. You don't contemplate any arrangement like that?—No; we are going to establish our own laboratories.

5298. The University recognises extra-mural teachers, does it not?—The recognition is rather of a personal nature. The teacher applies for recognition, and is recognised.

5299. Do they always get recognition?—Not always, but I don't know that it has been refused to any of our staff. Many of our staff were teachers in the University. For instance, our Professor of Mathematics was a teacher in the University. It is evident that if he taught well enough in the University he deserves recognition when teaching out of the University.

5300. How far does that recognition extend?—To probably five or six individuals. It is not a privilege that is much exercised.

5301. Are you some distance from the University?—Yes. A distance in time of a quarter of an hour by tramway or subway.

5302. Does that make a serious obstacle in any mutual arrangement for education?—Possibly; but we do not move out of the centre of the town because our students come in largely by train, and we must be

near the stations. That was the principal reason for fixing the site of our new building where it has been fixed.

5303. The arrangements of the University affected only the day students?—Yes.

5304. That is a small part of your work?—In numbers, yes.

5305. Have you any special arrangement for research?—No; we have not been able to set aside rooms for research.

5306. In the new building will you be able to do it?—In the new building we will be in a very different position.

5307. And as regards staff, will you include the prosecution of research—will you regard that as an essential part of it?—That would be a revolution at present. Our staff are fully occupied with their teaching duties at present.

5308. It has been put before us by several witnesses and impressed upon us as of immense importance, the desirability of leaving the technical teachers such leisure, time, and energy at their disposal that they can work seriously at research?—Yes, I think it is exceedingly desirable, but our finances would prevent us doing that. If we leave a teacher with leisure for research, we must find a substitute for him when he is at that work and, of course, that means money.

5309. But you regard it as desirable?—Yes, but the first duty of a College is to teach.

5310. Dr. STARKIE.—The teachers you spoke of who attended the lectures at the Technical College go through the whole course?—No; they came to us, as a matter of fact, for two definite courses—one in Botany, and one in Zoology. As part of their required course, they come to take one subject for one year and another for the other year.

5311. How many hours a week?—They have each two lectures a week and five or six hours' practical work during the summer session.

5312. Professor DICKEY.—Can you tell us the probable cost of the equipment of the new School?—That is a subject that is exercising us a good deal at present, but we propose to proceed very gradually. A question like that would depend on an answer, for instance, to the question, "Are we going to provide our own electric light and power station, or are we going to light from the city—are we going to expend £40,000 or £50,000, perhaps, in providing a thoroughly good central electric light station, or are we to take current from the town?"

5313. Supposing you had that, can you give us an idea of the cost of the equipment of laboratories, &c.?—No; but we contemplate an immediate expenditure of £20,000 or £30,000. I think it is impossible to immediately equip such a huge place as we are going to put up. Even if we had the money now, we should not spend it all at once, but spend it gradually, as we get into our new home.

5314. You don't provide for Commercial Education in your College?—No. That has been taken up by another institution in Glasgow.

5315. What is the nature of that institution?—It has been incorporated under the Companies' Act. The Athenæum is its name—an institution that has a peculiar history. It is working in association with the Chamber of Commerce, and I think is about to organise a proper course. At any rate, it is the intention of the Education Department that the Athenæum should take up commercial work.

5316. Do they propose to give a diploma or a degree?—They have not got so far as that. They cannot contemplate that for some time.

5317. Has there been any suggestion that the College should be connected with the University in any way?—I think not.

5318. Is there an Agricultural School in Glasgow?—Yes.

5319. Has it any connection with the University?—Yes, to this extent. that courses in the Agricultural College are recognised in the same way—not quite in the same way, but in a similar way—to the courses in the Technical College. Seven of the prescribed twelve courses for B.Sc. can be taken in the Agricultural College.

5320. Most Rev. Dr. HEALY.—In Glasgow?—Yes. The Agricultural College was made up principally of our former Agricultural Department, which was amalgamated with the Scottish Dairy Institute, in Kilmarnock. Until two years ago it was part of the Technical College.

5321. Are there many students attending it?—Fifty day students, and perhaps a little over fifty evening students, but there is an enormous number who attend the lectures given in the local centres.

5322. Do many of them proceed to a University degree?—Three of them are completing their course of study, and will go up for the degree examinations in April. They have not had time to complete their course yet.

5323. Professor DICKEY.—Is it under the Education Department?—Yes. It receives large grants.

5324. Yours is in connection, too?—Yes. The Education Department has recently issued a special minute under its Continuation Code for our College. We are to have a grant from the University of £4,900 a year for five years under that minute, and we are in general terms to carry on the work we were doing, leaving the elementary branches to other bodies in the town.

5325. Professor LORRAIN SMITH.—The grant is from the University?—No, from the Education Department.

5326. You said the University?—That was a mistake. I should have said the Department.

5327. Professor DICKEY.—I suppose the reason the University does not utilise your College is, that it has sufficient equipment of its own in these particular subjects—in Engineering, for example?—Yes.

5328. That is the reason?—One can hardly say that, because until the last two or three years they had scarcely any accommodation for their Engineering departments. In the time of Professor Rankin, he gave lectures only and had no laboratory. It is only in the time of the present Professor that a laboratory has been established, and only within the last twelve months has he had a room which could be called a laboratory.

5329. Mr. Justice MADDEN.—A sense of the necessity for laboratories is growing in the old Universities?—Yes.

5330. Professor DICKEY.—Suppose they had not funds for some reason, and did not think of establishing laboratories for the University, the probability is they would utilise your College, as the Edinburgh University utilises the Heriot-Watt College?—I should hope so.

5331. You are doing practically the same work the other Colleges are doing, that are recognised by Universities?—Yes. So far as Engineering is concerned, the course in the Technical College is very similar to that for B.Sc. of the University of Durham, conducted in Newcastle.

5332. Most Rev. Dr. HEALY.—How many Agricultural Colleges are there in Scotland that give higher education in Agriculture?—I think our own College—the West of Scotland Agricultural College—is the only College that can at present be called an Agricultural College. The Edinburgh and East of Scotland Agricultural College has just been formed.

5333. There is no third institution?—There is some kind of a school in Aberdeen, but I cannot give you any details regarding it.

5334. Professor DICKEY.—Are there lower Agricultural Secondary Schools?—Not that I am aware of.

5335. Mr. Justice MADDEN.—Are there any itinerant teachers of Practical Agriculture?—Oh, yes. The Colleges consider that the sending out of these teachers is a very important part of their work.

5336. And they do that work?—The West of Scotland Agricultural College has two or three lecturers of high rank, who spend the greater portion of their time in giving lectures in country districts. The College is largely maintained by contributions from the Councils of counties in the west, and the Councils desire some tangible return, and they desire that the lecturers shall go to their centres.

5337. We had interesting evidence as to the reception of these lecturers in Ireland and in England. I should like to have some information from you as to the receptivity of the Scottish mind when addresses by itinerant lecturers are given—is information sought after and followed by the practical farmers?—I think it is, to a limited extent. Directly the farmer thinks he can get something out of the lectures, he is keen to attend.

5338. Professor LORRAIN SMITH.—Is the Highland Agricultural Society not doing anything of the kind?—It is represented on the West of Scotland Agricultural College and it will be represented, I think, on the East Scotland College. But I don't know much of the east side.

5339. They have not an experimental farm?—Not that I am aware of. The West of Scotland Agricultural College has.

The Commission adjourned until the following morning.

THIRTEENTH DAY.

DUBLIN.
Nov. 29, 1901.

FRIDAY, NOVEMBER 29TH, 1901,

AT 10.30 O'CLOCK, A.M.,

At the Royal University of Ireland, Earlsfort-terrace, Dublin.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT. D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

Herbert F. Stockdale, Esq.

HERBERT F. STOCKDALE, Esq., Secretary of the Glasgow and West of Scotland Technical College, further examined.

5340. Professor LORRAIN SMITH.—Mr. Stockdale, will you be good enough to amplify your statement as regards the arrangement in the Durham University?—Yesterday, I did not say anything about the College of Medicine, a constituent College of the University; but I think, perhaps, I can give you some little information upon that which may be of interest. In addition to the College of Science in Newcastle there is also a College of Medicine. The College of Science, the College of Medicine, and the University of Durham, form three self-governing bodies. The College of Science undertakes a considerable portion—practically the whole, I think—of the first year's course for Medical students. The College of Medicine sends to the College of Science for Chemistry and Physics, and, recently, for Biology, its entering students. That is a point I did not bring out yesterday, and I think it may be of value.

5341. Then the certificates of these classes count for the Medical course?—Yes, they are recognised; and the Professors in the College of Science in these subjects are Examiners in the Medical examination in these subjects.

5342. Are the Medical examinations conducted in the College of Medicine?—In the College of Medicine; yes.

5343. How are these separate, what I may call constituent, Colleges governed?—The constitutions are different. As I said yesterday, the College of Science has an Executive Council external to the teaching staff. In the College of Medicine there is no such Council, and the Executive consists of the professoriate—practically of the professoriate.

5344. What do you mean by "external to the teaching staff"?—I mean outsiders—the representatives of the Governors and the contributing public bodies.

5345. But has the teaching staff no representation on the governing body?—Only in a consultative capacity; they have no vote. They have a right to be present at meetings of the Council, but they have no vote.

5346. As regards autonomy in these three Colleges: would you tell us something about that?—So far as finances go, each section conducts its own affairs. In the College of Science, in virtue, I suppose of the considerable annual subsidy which the University of Durham makes to the College of Science, the University—or, rather, the Warden, as representing the University—has practically the appointment to a very limited number of Professorships. But apart from that, the College of Science is entirely self-governing: it selects its own staff, and makes its own appointments.

5347. Who appoints to the College of Medicine?—To that I am afraid I cannot give you an authoritative reply. I think, very largely, the University of Durham. But I am not in a position to give you definite and authoritative information on that point.

5348. To come to another point. Can you tell us how these bodies are represented on the governing body of the University, as distinct from the Colleges?—Yes. The Principal of the College of Science is *ex-officio* a member of the governing body of the University—the Senate of the University.

5349. Is that all the representation?—That is all the representation the College of Science has, and that has been given only within recent years.

5350. How long has that arrangement been at work?—Oh, for many years. The College of Science, I think, with the exception of the Owens College, is the oldest of the University Colleges, and the arrangement dates back, I should think, twenty-four or twenty-five years now.

5351. Does the College of Science undertake the instruction of the ordinary technical classes—say of the College of which you are now the Secretary?—Yes. The whole of the work in Newcastle of the type done in the College in Glasgow, is done in the College of Science.

5352. The University students being day students?—Being day students.

5353. And you also have evening classes?—They have evening classes, and also students of the strictly technical type, who come to the College of Science with the intention of qualifying in Engineering subjects.

5354. Dr. STARKIE.—With regard to the fixing of the courses in these autonomous Colleges, I would like to have some information. Do the College Professors fix the courses for lectures in the College of Science, and also in the College of Medicine?—I cannot speak with authority of the College of Medicine, though I imagine the position is the same. In the College of Science the Council control entirely the course of study.

5355. The Council of the College?—Yes. Of course, they do not control the examinations. The Examiners in Science are nominated by the Council of the College of Science, but are appointed by the University of Durham.

5356. But does the University appoint any external Examiners?—Yes. When I say the Council nominate, they nominate the external Examiners.

5357. Who are associated with the teaching Professors?—Yes. The Examiners in every subject are at least two, one of whom is the Professor teaching the subject, and the other of whom is generally some eminent Professor from some other College. I think the appointments are for not more than two or three years.

5358. The degree of the University is given on the results of these examinations?—Quite so.

5359. But the course in which the examination is held must be, I suppose, satisfactory to the University authorities. Is it submitted to the University authorities for their sanction?—No; the course is arranged by the Council of the College, who can modify it as they think fit.

5360. Without any external control?—Well, the external control arises from the examination. If the course is not satisfactory it is obvious that students will not pass the examination satisfactorily, and that is where the control comes in.

5361. Professor LORRAIN SMITH.—The University arranges in what the students shall be examined?—Yes.

5362. And the course must automatically suit it?—Yes.

5363. Dr. STARKIE.—The University does arrange the subjects in which the students shall be examined?—Distinctly. The University controls the examination, and there can be no modification in the subjects of the examination, in the character of the examination, without the consent of the University.

5364. In that sense the programme is fixed by the University?—In that sense, certainly. But still, there is very wide liberty given to the College as to its methods of instruction.

5365. As to its methods of treating the subjects?—Yes; and, naturally, the University authorities would be careful to consult the wishes of the College of Science before making any change in the subjects of the examination, or in the character of the examination.

The Witness withdrew.

Sir THOMAS DREW, F.R.I.B.A., President of the Royal Hibernian Academy, examined.

5366. Mr. Justice MADDEN.—Sir Thomas Drew, you are President of the Royal Hibernian Academy?—Yes.

5367. You are a Fellow of the Royal Institute of British Architects?—I am.

5368. As you are aware, we are considering, at the present sittings, the question of University Education with special reference to what is called Technical Education, and you may accept that phrase in its widest sense?—Yes.

5369. Some evidence has been brought before us with regard to the position of the profession of Architecture, and to the desirability and possibility of associating the teaching for that profession with a University course of education. We should be glad if you would give us your views on that subject?—I may say that for many years past it is a subject which has been before my mind, and I have had frequent conversations with the late Professor FitzGerald, of Trinity College, who was interested in that subject very much, as to the means of the establishment of such a thing in connection with Trinity College. It has been a growing question. No such want existed when I went to serve my time, about fifty years ago, as an apprentice or pupil. The whole scope of the profession has enlarged and developed into something infinitely greater than it was then. It had no literature then, or practically none, you may say; photography had not been invented; travelling had not increased. It is the growth of all these things, and especially the growth of architectural literature, which has caused the demand for education to spring up. The weight of this demand is daily increasing, and it is a very serious question. From my point of view it is absolutely necessary that the architect of the future should have the liberal education which has now become essential for members of the profession.

5370. You speak of "serving your time." Was the usual mode of introduction to the profession that of apprenticeship?—Yes, apprenticeship in the old crafts form, under indentures, and it still is the formal avenue to the profession, for the most part.

5371. What evidence had the public, or have the public now, of the fact that a man who professes to be an architect has received any education, even in the sense of professional education?—There is none, except what has grown up by the necessities of the case, and has been established by the voluntary efforts of the Royal Institute of British Architects, who, there being no other means of doing it, have themselves established a series of voluntary examinations.

5372. Perhaps you would explain to us the constitution of that body. In the first place, how long has it been in existence?—The first association of architects for any common purpose dates from 1837. In that year a Charter was granted to the Royal Institute of British Architects, and two years later a Charter was granted to a small body of architects in Ireland—the Institute of Architects of Ireland—which, however, did not do very much work. Indeed, for many years during my period these bodies had not been very keen to recognise the necessity for Architectural Education; it has been a thing of comparatively recent growth; but latterly it has become so pressing that the Royal Institute of British Architects, during the last ten years, have been exceedingly active in establishing a course of education which is entirely voluntary.

5373. Do they give a diploma?—They do.

5374. Is that the result of an examination?—It is the result of an examination, or of an architect's known works that he has executed. For instance, I am of such an age and standing that I hold a diploma from the reputation of the works which I have executed. Of course, they would not expect an architect of known and recognised standing to undergo an examination.

5375. Is it a teaching body?—It is not directly a teaching body but it is supplemented by a very powerful organisation in London—The Architectural Association.

5376. What are the functions of that body?—It is a self-educating body of upwards of 1,500 of the younger members of the profession. It is encouraged and subsidised to some extent by the Royal Institute of British Architects, and it is most successful. During the last thirty years it has done a great deal in keeping classes going in subjects outside ordinary office-work. It is very largely and earnestly availed of by young men, and it is exceedingly active and useful in supplementing Architectural Education.

5377. Are there lectures delivered in connection with the Association?—Yes; there are lectures delivered by outside Professors, and papers read on different subjects by the members, and there are demonstrations, teaching of Water-colours, Mineralogy, Geology, and such like subjects. One of the functions of the Association is practising young men in Designing, which, perhaps, would not fall in with the routine of their ordinary office work.

5378. Is it your suggestion that the University should take up the work of educating men for this profession, and hall-mark their attainments by a special degree or diploma?—I think it is most important that the University should take in hand the literary education of the perfect architect—not the *technique*.

5379. Would you develop that proposition? Do you think that the Technical Education of an architect should be conducted in an institution apart from the University?—I think the first technical principles and the main technical part of the architect's education must always be acquired by the old crafts system, by serving an apprenticeship. Nothing will give the sense of responsibility, the practical knowledge, and instinct, but actual work and actual construction. Theoretical instruction will never impress that upon students.

5380. You would not abolish the apprenticeship system?—No.

5381. You would supplement it?—I think the general feeling of the heads of the profession is that it should be supplemented, and, if possible, strengthened and made obligatory.

5382. Would you develop your scheme of supplementing the apprenticeship system by the adoption of a system of University teaching?—It has been brought to my mind very much. I have had experience of a great many pupils and apprentices of my own, and this education is a crying want. In nine cases out of ten even a decent proper general education is lacking. It is peculiar, I think, to young men intended for the profession of Architecture. Their parents or guardians totally misconceive the qualities and the education required. The young men have usually undergone a very ill-advised special education, which does them more harm than good, to the neglect of their general education, which is so exceedingly important to an architect.

5383. Your idea apparently is that, concurrently with the special education acquired by apprenticeship, there should be a course of University instruction?—Yes, certainly.

5384. What inducements would you hold out to students to devote themselves to University studies?—Well, we have already inducements with regard to these voluntary examinations of the Royal Institute of British Architects. The probationary, and some of the minor examinations, are dispensed with altogether in the case of graduates of a University. In fact, their functions as regards those probationary and minor examinations is largely a matter of necessity in dealing with the liberal education of these probationers, and is, I think, outside the proper role of the Institute. They have been obliged to apply tests and institute examination, and in general education, and even in ordinary writing, spelling, and so on; and it would be better if they had the assurance that the students had received a good education in some other way.

5385. Do you think the University should give degrees or diplomas in Architecture?—I think it should give some testimonium, or some minor degree. I do not think it should be confined to architects only; it might be a degree taken by other intelligent scholars in cognate subjects.

5386. Under a curriculum which should embrace Architecture in its highest sense?—Yes; Architecture in its history and literature, and so forth.

5387. In that way the practical knowledge acquired by apprenticeship in the master's studio might be supplemented by higher teaching in subjects immediately connected with Architecture?—Yes, subjects, for instance, that would give him a greater stimulus and interest in his profession. That is a general want.

5388. Dr. STARKIE.—What would you call this degree? Would it be a degree in the Fine Arts?—I think it might be called a degree in Architecture.

5389. Mr. Justice MADDEN.—To what extent do you think the candidates for such a degree should take up

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the ordinary Arts course? Do you think they should graduate in Arts?—I think they should graduate in Arts, certainly.

5390. Would there not be a difficulty then: would not that impose rather a heavy burden upon a pupil in an architect's office, if he were not only to take up the course in Architecture in the University, but also concurrently the ordinary Arts course?—Well, I have had instances of it. Some few of the best of my pupils took their University degree and went through the course *pari passu* with their apprenticeship.

5391. Dr. STARKIE.—Did they attend a residential University?—They attended Trinity College.

5392. Did they attend lectures?—They attended lectures sufficiently to graduate and take their degrees.

5393. Mr. Justice MADDEN.—There is another course which might be suggested, and that is, that a candidate for a degree in Architecture should follow the Arts course up to a certain point?—Precisely so.

5394. Possibly, after a year of the Arts course, he should be allowed to specialise?—Yes.

5395. And then his education, so far as the University is concerned, should culminate in a degree in Architecture?—Yes; the degree, or certificate, or testimonial, whatever it may be called, would carry weight.

5396. I presume your idea is, that in the course of time the public would come to recognise that if they wanted architects of the highest class, they should seek them amongst the holders of those degrees?—Yes, I feel very confident of that, because already, under the system of the Royal Institute of British Architects, their diploma is being looked for by the public.

5397. We know there are a great many architects, or persons calling themselves architects, in Ireland, and some eminent and excellent architects. What proportion of the practising architects in Ireland hold the diploma of the Institute?—Well, there are comparatively very few in Ireland. There are fewer than in Manchester, or Liverpool or some of those great centres. In Ireland they are a comparatively small body, but I should say that out of the twelve or fifteen architects there may be in Dublin, probably six or eight hold the diploma.

5398. It is very hard, is it not, to say exactly what constitutes an architect?—Yes, precisely so; but during the last half century the definition has been growing very decidedly.

5399. You apparently would not regard as a member of the profession of architects any person who had not served an apprenticeship to a recognised architect?—No; that is our view—except under very exceptional circumstances.

5400. The expression, "qualified architect," has been used. What meaning does that convey to your mind?—It conveys to my mind a man who has served an apprenticeship, and has a certain amount of experience—a good deal of experience, in fact—of practical work, who has executed some works which proved his knowledge.

5401. It has been suggested that a system of registration of architects should be established. For that purpose legislation would be necessary. Does that suggestion commend itself to your mind?—The question of registration has not been before us up to the present time. There have been a small minority of architects who have been for some years trying, in successive Parliaments, to promote a Bill for the registration of architects.

5402. The great difficulty in establishing a system of registration is, that you must start with existing facts. It would be very difficult to exclude from your first register any man, no matter what his qualifications might be, who was in practice as a matter of fact, and then the public would not have the same means of distinguishing between really qualified architects and mere pretenders, as they would have if there were the hall-mark of a degree attached to a complete education in Architecture?—Precisely so. There would be the hall-mark of a sufficient liberal education conveyed by that degree—a thing which no registration could convey. Registration could only touch the fringe of technical knowledge.

5404. It must be founded on what exists as a matter of fact, and not on what ought to be?—That is so. It might be of interest to the Commission if I mentioned what I thought might be the subjects embraced by a Chair of Architecture.

5405. It would be extremely useful?—I hold a very strong opinion indeed that it should keep itself clear of a Technical School within the walls of the University, and that the subjects taught should be those of a general education in Architecture, such as the History and Literature of Architecture of the world, the work of all nations, which is now a part of necessary knowlege. I think it is an exceedingly important thing that it should include in addition a course of Modern Languages. A crying want of uneducated architects at the present time is a want of knowledge of French or German. It shuts them out of the literature of those countries, and is a great obstacle to learning by foreign travel. That is almost universally a very serious deficiency in young men I have had to deal with. There should also be a certain amount of theoretical teaching in Architecture, and Jurisprudence as connected with Architecture. I think it is desirable that a young lad should get some ideas into his head of the Law of Contracts, the common law relating to building, and of the course of decisions in law, of arbitrations, and many other things, which I am sure your lordship will understand touch the fringe of the architect's practice. A young man does not acquire a knowledge of these things during his apprenticeship; he must pick up that knowledge for himself by experience. Again, I think the Chair might deal very well with the new or modern relations of Architecture to public health and sanitation. There are many kinds of knowledge that an architect should possess in that direction. For instance, in regard to modern medical requirements for hospitals, asylums for the insane, and that class of institutions, as to which he should have a general knowledge, which, as a young man, he usually has not. Then there is the problem of the housing of the poor; a man might acquire ideas upon that social question before he came to Practical Building. Then, of course, as we know, one of the great things necessary, and which we should try to get for the young architect, is the power of graphic expression, both by writing and drawing. I think a Chair of Architecture might do much to develop the literary ability and descriptive power, which is not done in practice in the office of a master. I think, too, that the student's interest should be aroused in the fine arts and crafts of all countries, which are ancillary to Architecture. He is usually deficient, too, in such things as Elementary Statics and Dynamics, and he has no opportunity of acquiring the knowledge afterwards. Then such subjects as Elementary Geology and Mineralogy he requires some information about, which information he does not obtain in his master's office. That observation applies also to Chemistry. In such subjects as these, which he has not the opportunity of learning in his practical apprenticeship, it would be most desirable, if his interest were aroused, and knowledge imparted by lectures in a course in Architecture.

5406. Most Rev. Dr. HEALY.—I am not qualified to go into detail in regard to some of these matters, but perhaps you will allow me to ask you one or two questions upon points of general and historical interest. Is there any such thing as an Irish Institute of Architects as distinguished from the Royal Institute of British Architects?—That requires two answers. There is an old institution, of which I have been President for fifteen years—the Royal Institute of Architects, which has been chartered since 1839.

5407. Does that exist still?—Yes, and it is in an exceeding healthy state, and a system of instruction has been established, in alliance with the Royal Institute of British Architects. Some eight or ten great centres have become allied societies, practically blending them in their public acts.

5408. You are aware that during the period of the Irish Romanesque, before the Anglo-Norman invasion, we had a very distinctive School of Irish Architecture, had we not?—Yes; a most interesting school.

5409. And that school left some beautiful work behind it, did it not?—Yes.

5410. Of which we have traces in evidence still. That did not come across the Channel from England or Scotland, did it?—No. That is one of the very interesting subjects which might be taken up by the Chair of Architecture, from the historical and ethnological view.

5411. From that view, of course, that would be most interesting; but what I want to ascertain from you is, do you perceive at present any tendency to the development of a National School of Architecture, as distinguished from British Architecture, in Ireland?—I am afraid not; I am afraid the reverse.

5412. Do you think that your suggestions here, if they were adopted—and I hope they will be—would tend in any way to the development of a National

School of Irish Architecture?—Oh, I think so, enormously; they would get it out of the groove it is in. I have a strong opinion that Architecture in Ireland is in a groove, and not a progressive one.

5413. Mr. Justice MADDEN.—By being in a groove, I suppose, you mean that it is mere imitation?—Mere imitation at present. I think in Ireland that is rather a weak point. It cannot be said that it is a fault, because it has arisen from the want of means for education.

5414. Most Rev. Dr. HEALY.—But if we had this scientific and artistic education to which you refer, do you think it would tend to the creation of a national School of Irish Architecture?—Certainly.

5415. And one might hope possibly would lead in the future to more beautiful work being executed?—No doubt. And I should say that our establishment of voluntary societies for self-education has already effected a great deal by unaided effort.

5416. Professor LORRAIN SMITH.—How far would these subjects which you have suggested as forming subjects of study for the degree in Architecture require new departments in a University or University College?—I do not exactly know what would be the departments that would be called for. There would be a Professor of Architecture, I suppose.

5417. Geology, for example, would not require a new department; or Chemistry, or Dynamics, or Modern Languages?—No; you would need no additional provision for those.

5418. Then as to the subject of Jurisprudence: how would you suggest that provision should be made for that?—Well, that might be done by occasional lectures. Perhaps a member of the Bar might be got to come in and give them.

5419. It might be tacked on to the Faculty of Law?—Yes.

5420. Then as to public health?—That might be supplied by the Medical Faculty.

5421. Then with regard to the housing of the poor: that might be dealt with by the Chair of Economics, I suppose?—By the Professor himself, or by someone well versed in the subject—probably an architect.

5422. Then as to the Literature of Architecture: that might be in connection with the Chair of English and Modern Literature?—Well, I meant to convey more the Literature of Architecture.

5423. Then you referred to the subject of lucid expression in English?—That would come, in a great measure, under his general education, as a graduate in Arts.

5424. Then "Fine Arts and Crafts": I think, probably, that would be a new department?—It would; perhaps an occasional outsider would be brought in to lecture in that.

5425. Could that be united with the Architecture of the world?—Yes, it would be part of that.

5426. Those would come under the same department?—Yes.

5427. So that practically you ask for the establishment of one new department and the re-arrangement of certain others?—Yes. I think it would be desirable, too, that there should be encouragement, at all events, to take up, in the architectural course, Drawing—not technical Drawing, but as a Fine Art, to get a certificate from the School of Art; not architectural drawing—Drawing from the life or from the round.

5428. How far would this examination correspond with the present examination for the membership of the Institute?—It would correspond identically, I think. I can hand in to the Commission a synopsis of their examination.*

5429. I mean, would the Institute allow a substantial part of that examination as a qualification for membership?—They do already; I have it with me in print.

5430. That would be an inducement?—It is an inducement. They welcome a graduate in Arts from the University, and omit the probationer's examination.

5431. Another point is this: Would the period of apprenticeship be curtailed if a student had passed this examination?—Well, speaking for myself, and perhaps some others, I think that that does not arise in this way; we are of opinion that the apprenticeship has been already far too much curtailed.

5432. Mr. Justice MADDEN.—What is the existing term of apprenticeship?—Sometimes only three years, sometimes four years. In my opinion, four years should be the minimum, and it would be much better for a man that he should serve five years.

5433. Professor LORRAIN SMITH.—Is there any objection among architects, such as merchants and manufacturers have, to letting men attend courses at a University at the same time as they are serving their apprenticeship?—No, I think not. I know I have never offered any opposition. Of course, attendance at lectures takes a man a little from his work, but I have not found it to be serious. I have always encouraged it.

5434. Do you think that that course would be adopted by the profession?—I think so.

5435. Because there seems to be a very strong opinion amongst manufacturers, for example, against allowing anyone, while serving his apprenticeship, to be at the same time attending lectures?—Well, there are objections certainly, and there are some inconveniences; but my own feeling is that they are outweighed by the advantages.

5436. You would advocate day teaching?—Yes, to such an extent as can be allowed.

5437. A compromise is arranged very often by the technical students going to evening classes?—Yes, that course would be very desirable. Evening classes should be established and used so as to draw a man as little as possible from his daily pursuits.

5438. I want your opinion on that point One can hardly regard evening classes as of the same standard as day classes, and in arranging to give a degree which involves a liberal education, one would be inclined to arrange for day study, if possible?—Well, my feeling would be that, suppose I had an apprentice, he would be withdrawn for a portion of the day once or twice a week to attend lectures, and then, when the time came for his examination for the degree, he should have sufficient time allowed him in the day to sit for the examination. But endeavour should be made to avoid interfering with the daily routine of business as much as possible.

5439. You do not think there would be any advantage to deduct some time from his apprenticeship?—I do not think that would be an advantage. It is seriously felt already that his practical work is too limited. As a rule, it is necessary to raise the enthusiasm and interest of the student in the great profession he has adopted, but I think he should occasionally go into the outer air from his office and hear lectures on the broader view of his profession—that would do him good.

5440. Do you think your opinion would be adopted by the other heads of the profession?—Well, I know the Royal Institute of British Architects will go on with their final examination and diploma, and probably get it legalised.

5441. And probably get it legalised?—And probably get it legalised in time, and it will be the body to confer the complete diploma of Master of Architecture.

5442. Dr. STARKIE.—In your Summary you hold out the hope that this untechnical course in Architecture might be shared by students in other faculties as a subject of educative interest and usefulness. Is it your idea that those students who do not intend to take up the profession should also qualify for a degree in Architecture?—I think that would be a question for the University, whether they thought that students who were not graduating in Architecture should be excluded from these lectures.

5443. What I was thinking was, that if the history of Architecture is to be made an element of general education, it ought to be combined with the study of the history of cognate subjects like Sculpture and Painting?—Those should be part of the Architecture course.

5444. Why, in that case, call it a course in Architecture, and not "Fine Arts"? In Cambridge there is a Professor of the Fine Arts, and so also there is at Oxford?—Architecture I regard as the mother of all Arts, and the most inclusive.

5445. Architecture in the time of the Greeks was a term much broader in its significance than at present?—You need not go back to the time of the Greeks, or of the Georges, because Architecture has grown to a position it never held in those days.

5446. But at present is not Architecture looked upon as having a very definite significance—as excluding, you might say, the study of Painting?—He would be a very ill-educated architect now who was not acquainted with the history of Painting and of Sculpture, too.

5447. No doubt; but would you have any objection to the degree being called a degree in the Fine Arts, for which students whose only aim was general culture should compete?—Yes, I would. I look at it exclusively from the architectural point of view, and to be

* "The Calendar of the Royal Institute of British Architects, 1901-2, page 254."

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a thing of value to the students, it should be a diploma or testimonium, or whatever it may be called, in Architecture from the University.

5448. I see from your Synopsis that you look forward to a final diploma which would be given to persons qualified to be called "Masters in Architecture?"—Yes; that is as well as I could express it.

5449. You have already provided for the technical training of the architect in his apprenticeship?—Yes.

5450. Do you not think that a degree in the Fine Arts would be of equal value to the architect, if it were known that the course in Fine Arts included the history of the Architecture of the world, in addition to the history of Sculpture and Painting?—Well, it is of the public I am thinking—its effect upon the public, and the knowledge it conveys to the public. The name, I think, is important. A diploma in the Fine Arts from the University would not convey to the public that which I think we want to have conveyed.

5451. Would there not be a danger, if there was a degree in Architecture, of that degree being considered as of more importance than your diploma, which, of course, implies a good deal more?—There should be the greatest care taken that it did not convey that, or anything approaching it.

5452. Usually in Germany and in England a diploma is not considered as valuable as a degree?—It would be simply this, that whatever certificate the man brought from the University would be accepted by the public as a guarantee that he was an educated man, outside the technical part of his craft. It would be very important that it should convey no more than that.

5453. Would you be in favour, say, of similar degrees being given in Sculpture and Painting?—No. I look upon the history of Sculpture and Painting, as taught by an Architectural Chair, as quite a kind of by-issue—that the men should have some knowledge of those subjects as forming part of the Arts ancillary to Architecture. He should not be ignorant of the Sculpture and Painting of past days.

5454. In some part of your evidence you stated that a great part of the narrowness of the education of architects at present was due to their ignorance of foreign languages, and to the fact that they had not travelled sufficiently. Would you be in favour of the University founding travelling Scholarships in Architecture?—It would be an admirable thing. We have already done it to a large extent ourselves. We have a number of travelling Scholarships to be competed for annually.

5455. Professor DICKEY.—Would you consider it essential or advisable that an architect should have some knowledge of Engineering?—He should, to a certain extent. I can speak with confidence as to that, because I was apprenticed to a civil engineer myself, and in early life had some experience of Civil Engineering. In my opinion, he ought to have a certain amount of knowledge of that subject.

5456. How much should be know—do you mean simply the principles of Engineering?—Well, it is a more technical matter; he should learn that in a technical way. He should understand, in common with Engineering, Iron Construction, the calculation of strains on iron, and many of those questions in Statics and Dynamics, which are more essentially connected with Engineering.

5457. That might be learnt in the University, I suppose?—I do not think that is very important. It is a subject which he could, to a great extent learn from books.

5458. It would not be part of his Technical Education?—No; I do not think it is worth dwelling on. If he has any use of it in his profession he will be able to master it.

5459. You would not think it necessary to include it in that University course?—No; I would keep it distinctly apart. The two professions have such different aims that to combine them would be only mischievous.

5460. I suppose that practical and theoretical education ought to go hand in hand?—They ought, but in some subjects mere theoretical instruction is, I think, mischievous, and worse than useless.

5461. Take a University consisting of a federation of Colleges. Take Belfast, for instance. A young man studying for the profession of an architect in Belfast should have the facilities offered him in Belfast for obtaining the University Education necessary?—Yes, it is very desirable that that should be so.

5462. That would mean a Chair of Architecture, not for the University only, but for each individual College?—I think it would be very desirable, indeed, so long as it was always understood that the student was not in any way qualifying as a practical architect, but merely hall-marking his education in a general way.

5463. Are you familiar with the course of study required of students by the Intermediate Education Board?—No, I cannot say that I am. I have taken a general interest in the Intermediate Education question, but have not studied the details very much.

5464. But you have a general idea of the course?—I have a general idea of the course.

5465. Would it not be possible for a student who had gone through all the stages of the Intermediate Education Board to enter a University, and immediately, without any further course in Arts, specialise for Architecture?—Do you mean with respect to his taking a degree in Arts?

5466. With a view to taking a degree in Architecture. Would it not be possible for him to specialise directly, without being asked to pursue any further course in Arts?—That does not touch my point exactly. Our anxiety is that the future architect should, if possible, get a degree as the hall-mark of his education, wherever it is obtained.

5467. As well as in Architecture?—Architecture is looked upon as an additional and special subject. But the deficiency that is met with, and is every day met with more and more, is the want of a good general education outside the Technical Education. The degree in Arts would raise the status of the architect in the community.

5468. Mr. Justice MADDEN.—You contemplate your students, in order to be fully equipped, taking a degree in Arts. If a new degree were instituted—a degree in Architecture—either of two courses might be adopted: A student might take that degree along with a degree in Arts; that is to say, go in for two courses. But we cannot shut our eyes to the fact that that would be rather a heavy burden, particularly if, at the same time, he were going through a course of practical training in an architect's office. But supposing the degree in Arts could be obtained by taking up as one of the subjects the course in Architecture which you suggest, would that meet your views?—I think it would be for the wisdom of the University to fix that. I think it would.

5469. What you desire is this: You want to attain a high standard education embracing an Arts course and also a certain degree of specialisation in the department of Fine Arts connected with Architecture?—I think that would be very desirable.

5470. You would regard it rather as a matter for the University to determine how that should be brought about, but it might be brought about by allowing Arts students to specialise towards the end of their course in Architecture and cognate subjects, taking those subjects up as a constituent portion of the curriculum for the Arts degree?—That is what I have in my mind. You have put it in a better way, but that is really what has been floating before my mind.

The Witness withdrew.

E. C. K. GONNER, ESQ., M.A., Professor of Economic Science, University College, Liverpool, examined.

Professor E. C. K. Gonner.

5471. Mr. Justice MADDEN.—Professor Gonner, you are Professor of Economic Science in University College, Liverpool?—Yes.

5472. That is one of the three constituent Colleges of the Victoria University?—Yes. We were the second in point of date. The University charter was granted to Owens College under the condition that other Colleges could be admitted, and we were the first to apply for admission, and, consequently, the second College in the University. Leeds, of course, is the third.

5473. How long has University College, Liverpool, been in existence?—Roughly, twenty years.

5474. It was established mainly with a view to education of a University type in connection with commerce, was it not?—No; of a University type generally.

5476. But it has been developed very much, has it not, in connection with higher Commercial Education?—To a certain extent only, and really to a limited extent. It was largely founded in response to the desire for a higher general education, and a higher general Medical Education. I should say that those were the two first great demands made in Liverpool. The development since has been mainly—or, I should say, our largest development, irrespective of those two headings—has been mainly on the side of Engineering and Applied Science, such as Applied Mathematics and Physics.

5477. The application of education of a higher type to Commercial Education is an idea of very recent growth, is it not?—Yes. It has been associated with—it has always been held in view by the College from about the year 1887, and my Chair was largely founded in connection with that.

5478. So I understood. Perhaps I inferred a little too hastily from the circumstances that your Chair was founded for that purpose—that the College was originally founded with that special view. Would you kindly explain to us the constitution of University College and its relation to the Victoria University?—The College is under the government of a Court. The Court is mainly composed of nominated members by the Crown, of representatives of other bodies, and of donors of certain sums. That, of course, is a large body; but it is not what you would call the executive body. It meets twice a year. The executive body is a Council of the Court, which consists of members appointed by the Court, of members appointed by the City Council, and certain members elected by the Senate of the College, the Senate being composed of all the Professors of the College. The executive power rests really with the Council, educational matters, both by Charters and Statutes, being submitted to the Senate. The Senate, as you will see from reference to our Charter, has certain actual privileges, but all its minutes and regulations are subject to a revisal, and to confirmation by the Council, to this extent: that the Council can suspend the action of any regulation of the Senate until the pleasure of the Court has been taken upon it. Practically, the management of the College has been between the Council and the Senate, and there has been no difficulty whatever.

5479. Is the Senate a University body?—The Senate is a body consisting of all the Professors of the College.

5480. The College, then is autonomous?—Quite autonomous. We have no interference whatever in our autonomy, in our teaching, and in the development of our teaching system, by the Victoria University. The Victoria University is a body composed of the three Colleges which meet for examination purposes, and, of course, for the recognition of the courses which are suitable for such examinations. But each College can give any courses it likes, without reference to the University. The only point with regard to the University is that the University has to determine whether attendance at particular courses constitutes an attendance which it considers necessary for degrees.

5481. Quite so. What is the governing body of the University?—The governing body of the University consists, in part, of nominated members.

5482. Nominated by whom?—The Crown, and other bodies. You will see that a great many bodies really nominate, and there are, of course, life members in the Charter. The University Court consists of members appointed by the Crown, by the Lord President of the Council, some for life and some for terminable periods, some appointed by the Chancellor (who, in this case, happens to be Lord Spencer), and certain members appointed by Convocation, which is a body including, as in all Universities, the graduates of the University. These latter are elected by Convocation for four years. Then there come the representatives of the Colleges, and after the representatives of the Colleges we have members of the Senates of the Colleges chosen by the Senate.

5483. Dr. STARKIE.—That is, the Professors?—Yes.

5484. What proportion do they constitute of the whole body?—The Professors do not constitute a very large proportion of the Court.

5485. Mr. Justice MADDEN.—Are there any other constituent parts?—There are certain members chosen by the Court of Governors of the separate Colleges for a terminable period, and then several official members; for instance, the President of each College is an official member, the Chairman of the Council of the College, and the Principal of the College—these are all *ex-officio* members.

5486. There are three *ex-officio* members?—There are three *ex-officio* members in each case.

5487. Then there are the members chosen by the Senates of each College?—Yes; the number varies according to the Colleges. The Senate of the Owens College chooses four.

5488. And the Senate consists of Professors of the College?—Of Professors of the College.

5489. That is to say, the Professors of the Owens College elect four. How many are there from the other Colleges?—University College three, and Yorkshire three also. The Court of Governors also elect a certain number of members from its own number. Of course, it can nominate Professors, and in one or two cases Professors have been nominated by the Court of Governors.

5490. The Court of Governors of each College?—The Court of Governors of each College.

5491. How many do they nominate?—They nominate varying numbers. The Owens College nominates twelve, University College nominates eight, and Yorkshire College nominates six.

5492. What is the total number of members of the governing body?—I am afraid I could not say. I am sorry I did not get this up; but I did not expect to be examined on it.

5493. You can put it in your evidence when you get the proof?—Very well.*

5494. Dr. STARKIE.—At all events, it is a very large body?—It is a very large body; and the number of Professors on it is very small.

5495. Professor DICKEY.—How many representatives of Convocation?—That varies, of course, with the number of graduates. There are ten now.

5496. Mr. Justice MADDEN.—At any rate, it is a large body?—It is a large body. But it is not the executive body.

5497. What is the number of members of the executive body?—The executive body is the University Council.

5498. First, how many members are there of the Council?—I should have to count them up to answer that question. There are thirty-three. It consists of the Chancellor, the Vice-chancellor, the *ex-officio* representatives of the three Colleges, viz., the President, the Chairman, and the Principal—of course, the President is merely a nominal member of all these bodies; he never attends except on very great occasions. In one case the President is the Duke of Devonshire; in our case he is Lord Derby; and in the case of Leeds he is the Marquis of Ripon. Of course, they do not very often attend. Then you come to certain members appointed by the Lord President of the Council. They are appointed from members of the Court. Then you have two members elected by the Court out of the Convocation members of the Court. Then there are four co-opted members of the Court from their own number, and then you have all the representatives of the Senates of the three Colleges; that is, the ten Professors who are on the Court are necessarily on the Council, and the Council being a comparatively small body, though they do not numerically have a preponderance, in point of fact at meetings they usually have a preponderance; they certainly have a very strong working voice in the arrangements of the University. Of course, the arrangements of the Council can be reversed by the Court, and are sometimes reversed by the Court; but most of them are passed by the Court. I have not fully defined the constitution of the University, because, although it has no very strongly defined powers, the educational control of the University largely lies in the hands of what is called the Board of Studies. The Board of Studies consists of all the Professors of the constituent Colleges, of all the Lecturers who have also been nominated to be Lecturers of the University by separate nominations made from the Colleges and confirmed by the University Court, and of the Examiners.

5499. Dr. STARKIE.—Even the external Examiners?—The external Examiners are necessarily members of the Board of Studies. Of course they do not usually attend except at what we call the examination meeting; but they have the right to attend. Then the general Board is split up into a number of departmental Boards, with which I do not think I need trouble you, dealing with the various subjects. But the educational control really lies between the Board of Studies and the Council.

* The total number is 72.—E.C.K.G.

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5500. Professor LORRAIN SMITH.—Do these ten Professors who are members of the Council examine?—They may, or may not, be Examiners.

5501. I mean, it makes no difference?—It makes no difference to their being teachers or Examiners. We have in examinations one internal Examiner in a subject or in a particular grade of a subject, and an external Examiner also, so that sometimes a Professor of a College who is a member of the Council may or may not be examining; it makes no difference whatever to his position.

5502. Dr. STARKIE.—One word in connection with that. Do the Board of Studies draw up, we will say, any programmes of studies or syllabuses, and submit them to the Council for approval?—Yes; the Board of Studies always do that; and, taking matters as a general rule, their programmes are merely passed by the Council and the Court as matters of form. But recently, for instance, there was a question raised as to the advisability of the institution of Theological degrees in the University. That was really dealt with by the Court and the Council, and a reference was made to the Board of Studies. The Board of Studies, as a matter of fact, objected to the particular scheme; but, even had they passed the scheme the decision would certainly have been re-canvassed and, possibly, negatived, by the Court. In a case like that the Court would, no doubt, exercise very strong power; but in the ordinary routine of studies the suggestions of the Board are usually adopted. You will understand that the three Colleges are quite separate from the University organisation. They can hold any courses they like, the only question with regard to their courses being whether the University will recognise those courses as due courses of studies for particular degrees. But, subject to that, we are quite autonomous.

5503. Mr. Justice MADDEN.—You are quite autonomous?—We are quite autonomous as to fees and control of students.

5504. The College is the teaching body?—The College is the teaching body.

5505. And the University is the examining body, is it not, for degrees?—Yes.

5506. And the functions of the University are to prescribe the courses of study for the degrees?—The courses of study and the courses of lectures which have to be attended, because, of course, no degree is given in the Victoria University which does not include attendance at a certain course of study.

5507. In other words, it is a teaching University, and not a purely examining body?—Not exactly.

5508. Or, rather, it is a University founded on teaching?—It is a University which involves teaching.

5509. Your expression is more accurate. What I mean to convey is this: it is a University the degrees of which are obtainable only through some recognised course of study?—Certainly.

5510. The University does not teach?—No, the University does not teach.

5511. But its degrees are obtainable only by attendance on lectures in a prescribed course?—Precisely.

5512. What is the course of study required for attaining the degrees?—I suppose you refer to the Arts degrees. The Medical degrees, of course, are quite separate; they are largely under the control of the General Medical Council.

5513. Take the Arts degrees?—For the Arts degrees there is a three years' course. We allow students to take their final stage at the end of the second year, but we then demand that they shall remain a third year in the College, taking, as it were, a post-graduate course of study, before they receive the degree. But they may take the examination at the end of the second year. That is a new innovation, and the privilege is granted only in the case of very good students, who wish to take an ordinary degree and then to specialise in the third year.

5514. Is there any University examination, as distinct from College examinations, except that for the degree?—We give certain certificates with regard to certain more or less technical subjects.

5515. I was referring to the Arts course?—No.

5516. Is there anything corresponding to a "Littlego" examination?—Yes; that is part of the degree regulation; we have three examinations.

5517. Are there three University examinations leading up to the degree?—Yes, leading up to the ordinary degree—the preliminary, the intermediate, and the final. In the case of the Honours degree, the course is different. The intermediate is practically omitted.

5518. Now, are there professional schools recognised by the University; I mean to say, is there a degree in Engineering or in Agriculture?—The University gives Agricultural degrees and certain degrees in Engineering.

5519. The teaching for which is, of course, in the College?—Yes, entirely. A College can be a College of the University, and still not take up one particular faculty. For instance, for a long time we had not any Law Faculty. We have a Law Faculty now. It is not incumbent upon a College that it should teach for every degree given by the University. I would like to point out that the difficulty that we find with the relation between the College and the University—because there are certain difficulties, as there are certain advantages—is really threefold. In the first place, we find that the local sentiment and the local interest in the College are not the same as they would be in a University. Of course, I am quite aware that this is a matter of sentiment, but sentiment counts for a very great deal, certainly in provincial towns; and the mere fact that our students do not obtain their degrees in Liverpool, but graduate in Manchester has, I think, operated a little adversely to our popularity in the town. The Owens College, of course, by good fortune, has been entirely relieved from that difficulty, as the University is by charter necessarily established in Manchester. It has a separate organisation from the Owens College, but, geographically, of course, the contact is very close. You know that, as a matter of fact, the Victoria University has rooms in the Owens College, which is, of course, a most convenient arrangement. But the question of sentiment is one which cannot be ignored, especially when one has, on the one hand, the question of the number of students and the popularity of the College as an institution attracting students, and secondly, the question of money. Of course, we depend very largely for the maintenance of our work on the fees received, and on certain sustentation funds. In the latter respect I do not think we have anything really to complain of in Liverpool, because our endowments, which amount to about £500,000, have been almost entirely endowments by gift, and in addition to income from endowments, we have an income from the City Council, and we have certain Government grants, made to provincial Colleges by the Treasury on a quinquennial inspection.

5520. What is the number of students in your College?—I would rather not answer that; I could give only a very rough estimate, but I can furnish the information.

5521. We shall be obliged if you will do that. Perhaps you will supply the information when you receive the proof of your evidence?—Certainly.* I ought to say that at the present time there is a very strong movement in Liverpool for the conversion of the College into a University, a movement which is strongly sympathised with, not only by the staff of the College, and many of the public, but by the City Council, which has declared its intention of making application for power to give money for the foundation and maintenance of a University. It has passed a resolution to that effect. The second matter, in regard to which we find difficulty is, I think, the working difficulty. There are certain points of working difficulty. Now, the first point, and the most obvious, which presents itself, is the difficulty of travelling, that is, of the Professors from Liverpool and Leeds going over to Manchester. In our case, of course, it is not so very far. In the case of Leeds it is a very considerable distance. We complain, perhaps, more than Leeds does. The difficulty is this, that in order to attend a short meeting of the Board, of a quarter of an hour or half an hour, as the case may be, you very often have to spend a whole afternoon. The result is that we do not attend a great many Boards which it is desirable that we should attend. It means this, that if you think the Board is going to do the thing with which you agree, you do not go. Sometimes, of course, its action is not the same as you have anticipated, and then one regrets one's absence. I think that that is a very obvious and substantial difficulty. The next point is as follows, and it is rather more serious: that you get opinion crystallised in the Colleges before the various teachers of a subject have an opportunity of meeting; consequently, you find three bodies of men meeting with opinions formed already, opinions which they have formed by discussions in the various centres, and I am sure, as the Commission will recognise, that it is very much more difficult then to obtain a harmonious agreement than if the various members were in constant contact

* There are over 700 registered day students in Arts, Science Medicine, and Law, and, in addition, some 1,100 students attend evening classes in the College and its professional schools.—E.C.K.G.

from the commencement. Another practical difficulty is the difficulty which sometimes occurs from Professors in different centres taking different views of their subjects, and not being able to harmonise them by friendly contact. I can speak quite freely about that, because, as it happens, I have never had the slightest difficulty with my colleagues at Manchester. There have been three at Manchester during my tenure at Liverpool, and I have always been in most harmonious relation with them. But I have seen difficulties of that kind which, of course, do not add to the efficiency of the University. The third difficulty is, I think, a very serious one—that the teaching really follows the examination, and that the examination does not grow out of the teaching—that you are approximating in the Victoria University to an examining University. In our case, I think, the approximation is really as little as possible. Our connection with Manchester has been very close, and we have tried to prevent the examination, as it were, dominating the teaching too much. But if you attempt a federal scheme, in which the Colleges are a considerable distance apart geographically, you are almost sure to have a very close approximation to an examining University, and the teaching merely adapting itself to the requirements of the Examiners. These, I think, are the main difficulties which we have found. I think they are, on the whole, very substantial. The one I feel the strongest, I ought to say, is the last. That is the very serious difficulty that you do not have that, as it were, automatic and natural development of examinations from the teaching courses which I think is desirable in the very highest education.

5522. You said there were difficulties arising from the federation of Colleges under a common University, and that there were advantages also?—Yes; I think there is a distinct advantage at certain stages. It prevents the undue multiplication of weak Universities, and I certainly think that no University should be founded which is not able to prove that it is capable of giving instruction in a large number of branches in the very highest form. Subject to that, I think the multiplication of Universities is really a great advantage. But I do think that a number of very weak Universities would have been very undesirable. I think there is no doubt we owed a very considerable debt in our early years to the Victoria University. It gave us certain University privileges which, in 1884, certainly, and for a long period, we could not have demanded alone.

5523. Professor LORRAIN SMITH.—You said you had £500,000 in endowments, I think?—We have about £500,000 now.

5524. What do you contemplate as the requisite resources for establishing a University?—I should not like to say what might be put as the minimum. Of course, we have £500,000, and we derive, in addition to fees, probably some £7,000 a year from other than capitalised sources. But we naturally contemplate that our application for a charter will be accompanied by a large increase in our endowed capital.

5525. Mr. Justice MADDEN.—You said there were advantages at certain stages in the association or federation of Colleges under a common University, from which I conclude that you do not regard federation as the ideal system, but that you recognise that at a certain stage of the development of a University system it might be expedient?—Yes. I quite recognise that you may have to choose between two alternatives, and in that case I think federation may possibly be the less dangerous of the alternatives. I ought to say that I have derived a very great deal of assistance from association with colleagues in my subjects in other Colleges, and I should hope that that would continue in some degree if we were separated.

5526. Now, Professor Gonner, to pass from that interesting evidence to the position of the higher Commercial Education in the College with which you are immediately connected: would you kindly tell us what provisions are made in that College for education of this type?—I think you will see, from the rather imperfect Summary, that my evidence really relates to three points. In the first place, there is our actual experience—what we have attempted; in the second place, from that and from other information I should like to attempt to make some distinction between the various kinds of Commercial Education; and then, thirdly, I should like to add just a few words with regard to the kind of education which a University might be considered to undertake. Perhaps I might take the first point, which covers the first two heads of the Summary.

5527. I am sure that we should wish you to take your own course in developing your evidence?—Taking our own experience, we have made experiments at two times and in two ways. The first experiment was connected with what we called a College business curriculum, and the second with the development of what has been called the City of Liverpool School of Commerce. In 1887-1888 a curriculum of two years' study was devised. For students who were not attempting a University degree, but who, owing to their desire to enter business, wished to leave University College somewhat earlier than other students, there was a curriculum of two years, which was to terminate at the age of eighteen or nineteen in most cases, and in some cases between the ages of nineteen and twenty. The subjects of that curriculum I could give in detail if you liked, or I could summarise them. Roughly speaking, they are those literary subjects which lie nearest, as we might say, to commercial study. In the first year, for instance, there were English Composition, English History, Commercial Geography, Mathematics, one Language, and a second Language or one scientific subject, Mechanics, Chemistry, or Physics. In the second year there was an alternative, one of two courses: either English Composition and Literature, Commercial History and Theory, two Languages, and one optional subject; or English Composition and Literature, Commercial History and Theory, one Language, Mathematics, and one optional subject. These courses, of course, were courses of teaching followed by an examination—purely, of course, a college examination—and a certificate was granted at the end of the two years' course. With regard to that course, I would point out that the subjects were, in the main, subjects of liberal education, and they were really what I should call liberally taught, and not with a view to commercial use. For instance, the study of French was largely the ordinary study of French Literature and the French Language from a philological point of view. Further, I think one would notice that there was really very little development of what one might call economic instruction. The subject came in during the two years, but to a comparatively small degree. Again, there was no real technical commercial practice, or teaching of commercial practice, attempted. That is the first point that I would notice: that the subjects were liberally taught. Secondly, in connection with that scheme, I should like to say that we had the assent of the main banks in Liverpool, the main insurance offices, and over 300 of the leading commercial firms in Liverpool, to give advantages to pupils who passed through that curriculum, in most cases, to relax the system of apprenticeship (which curiously still continues in Liverpool) by one year. As a matter of fact, however, very few candidates presented themselves. About five altogether took certificates, and, I am sorry to say, that when they wished to find the advantages which were promised them so liberally, the advantage really amounted to very little. I do not think the commercial firms had really realised the gravity of their undertaking. Most of these students obtained situations, but with some difficulty. The first cause of the failure—and I think it was a distinct failure—was that the subjects were entirely literary. For instance, a French student passing through that course was taught in the same classes and in the same way as a University student taking French, no greater attention being given to what we might call the oral side of French apart from the literary teaching of the language. I am not, of course, suggesting for a moment that it should have been "Commercial French," as people sometimes call it, but it ought to have been an oral and practical teaching, as distinguished from a literary and philological teaching. The second difficulty was that there was a certain amount of want of harmony with the schools. The masters of schools felt that the course was to some degree an encroachment on their province, that boys were taken too young, and that they were taken through a course which really was very closely allied to their school work. The third difficulty was, I think, that there was no real inducement to a boy to take that course, unless he happened to be the son of a principal of a firm. As a rule, commercial clerks in Liverpool are required to enter at a very early age. If they do not enter at an early age they find that the education which they have attained is no compensation whatever for the loss of one or two years. They are not accepted. To go into business at nineteen years of age, even if you are highly educated, is much more difficult for a boy in Liverpool, than to go into business at sixteen, with a lower standard of education.

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The second experiment with which we are concerned is what is called the City of Liverpool School of Commerce. The City of Liverpool School of Commerce grew out of constant applications by the Senate of the College, by the Chamber of Commerce, and other commercial bodies in Liverpool, to assist some scheme of commercial instruction, which they might deem suitable for boys going into business. We began our new attempts in 1893-4, and for some years we met with a great deal of indifference. Three years ago, however, with the assent of the Chamber of Commerce and of the Technical Instruction Committee of the Corporation, a joint Board was appointed to undertake what was called the City of Liverpool School of Commerce, a small grant of £100, which the College had previously had from the Technical Instruction Committee, being given to the new School, supplemented by another grant, first of another £100, then of £150, from the Technical Instruction Body of Liverpool. The first development was in connection purely with evening classes, which met with a great deal of support from the Chamber of Commerce, and which has now been run for three years, this being the fourth session. It has been entirely successful; it is well-attended, classes being held in Languages, in branches of Arithmetic connected with Commerce, in Commercial Law, in Economics, in Geography, and also in what is called Commercial Practice, or the concrete study of commercial operations. These classes, of course, are nearly entirely attended by students already in business houses.

5528. Dr. STARKIE.—Of what age?—The age varies from about nineteen to over thirty years, but the mass of the students attending are from twenty to twenty-five, a fair proportion being from twenty-five to thirty, and, of course, over thirty it naturally goes down very rapidly. But the great mass of the students are from twenty to twenty-five. The instruction in some classes there is of a very high order indeed. The languages taught are French, German, and Spanish. Then, three years ago—a year after—we introduced under that Board a day School of Commerce, which was to have a definite curriculum of two years, designed for students from seventeen to nineteen years of age, and consisting in part of attendance at ordinary College courses, and in part of attendance at special courses instituted by the Board, the rough line of division being that those subjects which already entered into a liberal education were given in the College classes and attended as such, while for the other subjects classes were specially instituted by the Board. The classes are organised by the Board; they are held in University College, and they are under the disciplinary control, of course, of the authorities of the College. The third branch of the School of Commerce has consisted in the institution of certain language classes in the afternoon in some rooms centrally situated in the city, which are attended by, and limited to, those already in business. It was thought that these might attend during the luncheon hour, or in the hours subsequent to that. It was hoped at the beginning that the number of students would be very great. The attendance really is about 100, in three languages—French, German, and Spanish. We have them going on for about four hours in the day—Junior French, Senior French, Junior German, Senior German—in that order, so that a boy who wants to attend one course can go, say, from twelve o'clock to one o'clock, or from two o'clock to three o'clock. The classes are attended very fairly. I ought to say that it is not instruction really of a University character; it is very much more like that provided in the Schools of Modern Languages which are started in towns as private ventures. These are the three branches, and the branch with which we are more immediately concerned is, of course, the Day School of Commerce, which presents a regular curriculum, and, secondly, certain portions of the evening classes, because we gave up certain of the evening classes which we had always held, and let the School of Commerce practically take over the instruction in those subjects. With regard to the Day School, there are certain points of difference which, I think, the Commission will be interested to know about, as compared with our previous experiment—the Business Curriculum. The subjects are much more specifically taught with regard to their special use. That does not necessarily mean "Commercial German"—a phrase, I ought to say, which I particularly dislike—or "Commercial French," but that we teach French with the constant end in view, that the main object of the course is that the boy should be able to speak it, to read it, and to write it. Then, secondly, there is a good deal more technical work introduced. There are about eight hours a week in the course set apart for what is called the study of Commercial Practice, a commercial bureau. That is a study largely of commercial operations, analysed by the teacher. He says, "Now, if I had to do so and so, what would it involve?" Then he takes the students through the various stages it would involve, the reasons for those stages being given, it is supposed, in the more scientific classes. For instance, when questions of payments involving rates of exchange come up, it would be expected that the students had received instruction as to the economic causes governing rates of exchange in the classes that I take in Economics. I am afraid, however, that there has been rather a tendency to over-weight the course on the side of technical matters. In other words, the educational studies are not kept so strongly in view. That is what I want to say with regard to the course. If one comes to its success—the success of the School as a whole—the evening classes are undoubtedly successful, and the afternoon classes are fairly successful. They originated, I ought to say, in a proposal by a member of the legal profession—a lawyer who was and is on this joint Board—because our Law classes in connection with the legal studies are largely attended by solicitors already under articles, articled clerks, who attend during certain hours. They are sent by their firms, who wish them to go in for our legal courses, and this lawyer thought that that might also be done by commercial houses, but I do not think many commercial houses encourage their clerks to attend, and I do not think the work done in the commercial classes can be compared in extent with the work which is done in the legal classes for the legal clerks. The afternoon classes have been fairly successful. The day classes have not been a great success, and I think that is very largely due to two or three quite well-defined causes. In the first place, I believe myself that we have spent too much time on what has been called the technical side. The interest of some members of the Board was largely roused by accounts of certain foreign Commercial Schools—Swiss, and some French—where offices are fitted up, and where boys performed mock transactions with each other. Something of the same kind has been attempted, and, though restricted to certain hours, and thus only a small part of the work of the School, it has, I fear, created in the minds of the business public a certain amount of distrust, they regard it as an attempt to substitute for business experience a mock experience, obtained in mock transactions. I know that certain very important commercial men have expressed entire disapprobation of it. When I come to speak of foreign practice I can point out that this method is used in some foreign countries, but not in others. The second mistake has been that we have not very carefully distinguished the class of students whom we expect. You may attempt to attract two classes of students—those who are seeking clerkships, and those who through provision already made for them by their fathers or others, have places already found for them. These two classes present themselves at entirely different ages, and require entirely different instruction. Thirdly, there has been a certain amount of internal difficulty in the School, which I need not go into. There has been an attempt made to grant commercial certificates by the Victoria University in connection with evening work—not only with the evening work done at the Colleges, but with evening work done at various technical and other institutions in Liverpool and Manchester. Any technical institution could apply to be affiliated; and any association for teaching could apply. We have several associations, of course, which combine more or less philanthropic and religious work with teaching of classes in the evening. Some of them have applied, and they have been affiliated and allowed to send in their students for this examination. That is only with regard to a limited range of subjects, mostly of a technical character. The view which the University took was that it would be better than having an examination for which anyone could go in if we insisted, that they should have taken regular instruction at some institution which we believed to be efficient. That has not been a large success. Very few have presented themselves, and most of those who have presented themselves have been, I think, from one institution which has taken up the idea. The Owens College has attempted commercial courses during the past two years in the daytime. The experiment was unsuccessful last year, I imagine mainly from

reasons similar to our own, and this year it has remodelled its course. I do not know whether there is much prospect of success. It is attempting it, I think, on much higher lines than was done last year, and certainly on much higher lines than is being done by us. Now, when we come to the consideration of these various schemes altogether, you will see that we have made attempts and experiments in two directions: first, in the direction of merely taking those liberal studies which approximate to commercial use, and teaching them in a liberal way, not distinguishing between the drift or the direction of the study required for commercial men and the drift or the direction of the study for what we might call the ordinary Arts degree. In the second place, when we have distinguished, and when we have taught the students with special reference to Commerce, we have introduced a great deal of purely technical matters, as well as the office routine system and the analysis of business operations. Turning from the subjects to the classes of students, there I want again to enforce upon the Commission the very important distinction between two classes of students—those who are seeking clerkships, and those who have their positions in business in their fathers' business or in other businesses already found. These two classes of students are very different. They differ as to age—the age, certainly in Liverpool, and to a large degree in Manchester, for clerks being very low. The other class, of course, may come to any age; their position is found for them. They differ, naturally, as to the knowledge which they bring with them, because those who are seeking clerkships leave school at an early age, while the other class may pass through the ordinary curriculum of a public school, and then come up for instruction. It may be said, of course, that in what we have done we have not been attending to true University work. I think it is a very possible reproach that these experiments have not been connected with what I daresay the Commission would consider as essentially University work. But with regard to that, there are, I think, three things to be said. In the first place, provincial Colleges have to take things very much as they find them. We cannot, of course, exact from all our students on entering a standard similar to that which a University like Oxford or Cambridge can exact. All that we can exact is a standard at the termination of their University course, and I say quite fearlessly that I believe our Intermediate examination and our Final examination are quite as hard as most of such examinations, and harder than some of the University examinations at Oxford and Cambridge. I think our Final ordinary B.A. examination is a harder examination than the Final B.A. examination was at Oxford when I was there. But when students come to us we have to take them in a much rougher state; and we have considerable trouble in teaching in the preliminary year. The amount of tuition we have to give in the preliminary year is very great. Among our best students, I ought to say, are women students; they are very much more highly trained. They come to us because the prestige of Oxford and Cambridge has not been nearly so much established in the case of women students as in the case of men students; and, of course, the "Boats" and the "Eleven" are not such inducements in their case as in the case of the men.

5529. Mr. Justice MADDEN.—Are all the degrees of the Victoria University open to women?—Well, yes; with the exception of Medical degrees.

5530. But the Arts degrees are open?—Yes.

5531. The Arts degrees at Oxford and Cambridge are not open to women yet?—No, not the degrees, but the examinations are. The women students come to us at a higher stage than the men, and a very large number of them pass a preliminary examination before entrance. They are very efficient material. A large number of our men students have to be ground very carefully.

5532. For what special line of life are the women students qualifying, as a rule?—For teachers, almost entirely. You must remember that provincial Colleges have to take students at a little lower stage in their first year than should naturally be taken by a University, and it is, therefore, inevitable that that must entail a lot of extra teaching during the earlier years. Secondly, of course, a provincial College is largely bound to have reference to the standard of provincial Secondary Schools, and I am afraid that until recently the standard has not been extremely high in ordinary Secondary Schools. Of course, the Manchester Grammar School has been a notable exception from the ordinary provincial schools. But now the standard is rising, and we find every year that our students are coming to us in a better state of preparation. I have mentioned these points because I think it necessary to meet quite frankly the suggestion that this work that we have attempted is not of a University standard. It is quite true that some of our commercial work has been below that standard in the past. A third reason for that has been, of course, that, while there is commercial work which is of a true University character, the teaching of it involves a very large expenditure, and in what we have done we have had to consider the question of the actual cost of teaching, and if we undertake, as I hope we shall be able to undertake soon, work of a much higher character, we shall have to be prepared to make a considerable number of appointments in connection with it, and, consequently, to incur a very considerable amount of extra expenditure. The difficulties in the way of all Commercial Education are, I think, really two. There is the difficulty in the way of the demand for it by the commercial world. I am not quite sure myself how far commercial opinion in England is really in favour of high Commercial Education—I mean really in favour of it in what I should call a practical sense. Business men express themselves in favour of it in resolutions, I know, but whether they mean to encourage it as they alone can encourage it, I fear I cannot form an opinion. So far as the clerks are concerned, it would seem that they are not very much in favour of it. They still demand that clerks shall enter offices at very early ages. They still practically refuse to make any distinction between clerks of a higher standard, who may be entrusted with important work, and clerks of what we might call more of the office-boy standard. I am sure the members of the Commission have heard as often as I have that a clerk is required, as a rule, to go into an office very early, that he shall pass through the whole routine, that he shall begin at the bottom. Now, it is quite obvious that if you are going to make a clerk begin at the bottom, if you are going to give him work practically little superior to that of an office-boy, directing envelopes and the like for a considerable portion of his time, you will have to take him young. It is absurd, of course, to expect that a man should go through a higher Commercial Education and then be set to work of that character; but still that demand is made very widely. So far as the clerks are concerned, I think we may say that there is not a real and serious demand on the part of the commercial world for Commercial Education. The second serious difficulty, I consider, is owing to a confusion and a misconception as to the nature of the Commercial Education which is required, and a want of distinction between the different classes of Commercial Education and the courses of commercial training. We hear a great deal now in England as to the advantage of foreign systems of commercial training, especially with regard to what is termed the "bureau" system, or the introduction in Commercial Schools of an office, in which the boys engage in mock commercial operations with one another. With regard to commercial systems of education, in speaking of foreign practice, one ought to remember that they are by no means uniform. If we take Germany as a country with a system of Commercial Education, the bureau or mock office does not occupy a very important part in its curriculum. They do have classes at which such commercial operations are engaged in, but they treat these classes as practically subordinate to what we might call the more fundamental classes in the course. The great tendency in Germany has been to emphasise the higher intellectual character of the training, as distinct from the technique. There we have much to learn. At present, Commercial Education, I think is under the disadvantage that there has been no good conception formed of the different kinds of Commercial Education which may be required. So much with regard to the first point—our experiments and what they suggest. I should like now to come to the second point, which is the question of the different kinds of instruction. Here, I think, one might draw a very important contrast between technical instruction and commercial instruction, in two ways. In technical instruction there is always the use of tools and the use of machinery, which are very essential for certain classes of pupils. But the technique required in business, the use of tools required in business, the

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technique of business operations, is of course comparatively slight as compared with the use of tools in industries and manufactures. The scientific processes in Chemistry or Engineering have, I think, a technical side for which you cannot find a parallel in business. I believe myself that a thoroughly well-educated boy of, say, nineteen, who has got a good liberal modern education, ought to be able to pick up the technical details of office work in a very short time, say, in a few weeks. But, of course, in the case of an engineer or a chemist, if you put him into engineering works or chemical works, we should all agree that it would take him a much longer time to master the processes, and it would demand a great deal more knowledge and training, and I would distinguish between them in that sense. In the second place, in business, as distinct from technical manufacture, you have a much greater need for a high general intelligence and for a development of what I call moral characteristics, such things as judgment, decision, and insight. These are of immediate and paramount necessity to the business man. He needs them every hour of the day. In an industry or manufacture they are required to a much less degree. Those are two points of difference between manufacture and commerce which should find, I think, some recognition in the course of training which are applicable to those occupations. In business education one must never lose sight of the enormous importance of cultivating those branches of knowledge which lead to high general intelligence, and to what I should like to call high mental discipline. You must have a man who will be capable of promptitude, decision, and certainty. That is the first thing that I think essential in a business education. The second essential is that every man engaged in industry and manufacture should, if he is to direct the business, have a good general knowledge of the subject with which he is concerned. By this I don't mean that he should know French, German, and things like that. Those are very desirable; but he should realise the economic conditions which manifest themselves in business —the history of business, and the knowledge of business experience and progress in various countries. Commercial knowledge I would distinguish into three branches. The first of these is the acquisition of a good general knowledge and of the branches necessary for the conduct of ordinary commercial operations—what I may call the routine of business. If the business has to be conducted with France a knowledge of French is necessary; and if it has to be conducted with Germany a knowledge of German is necessary. Again, in business a knowledge of arithmetical calculation is necessary. Those are certainly preparatory studies which you can justly demand from anyone entering business. Education of that kind should be the work of the Secondary Schools. They should give an education which shall develop the intellect and include a knowledge of those subjects which may be important and useful in business. It is not the knowledge of business as an operation, but of the means whereby you conduct business. Secondly, you must have commercial instruction which is of a technical character, concerned with the routine of the office and business operations, a routine knowledge, for example, of the despatch of goods from one place to another, what documents are necessary, what are Custom House warrants, what are bills of lading. Detailed knowledge like that is desirable. Lastly, I think there is a wider kind of commercial knowledge, that is, a knowledge of the economic conditions of business, of the circumstances under which business has developed, and under which business is developing. I class that kind of commercial training with the very highest kind of technical training in industry. It is a study, not of the technique, but of the principles underlying the technique, and it is that study which I consider that a University may rightly undertake, and which I consider, so far as Commercial Education is concerned, can only be undertaken by a University. Taking those three forms of education, the first, I should say distinctly, is the ordinary work of the school. The second is very largely the work of the office. It is a question to which I may come in a minute or two, as to whether it should be undertaken at all by special Commercial Schools. I think, primarily, it should be the work of the office: it is to be obtained by experience, and I think it will occupy a very short time for an intelligent person to obtain it. The third is, to my mind, the proper work for a University. To sum up that point. The work of the schools, as I consider it, consists, so far as subjects are concerned, in dealing with such subjects as Language, Arithmetic, and so on, all those subjects which can be used for conducting ordinary business operations, which may be required indifferently by clerk or principal. I am not speaking of Commercial German or French, which is only an application of German or French to a commercial use, and which, I personally think, should not be taught at all. The essential thing is that a boy should know the language, and that he should be able to read, write, and speak it; and if he does that he will be able to acquire the technical words in a few weeks. If, on the other hand, he is only taught the technical vocabulary, it by no means follows that experience in an office will teach him how to read, write, and speak the language. That view, I think, coincides with the view of more enlightened employers, many of whom say, "I don't care whether you send me a boy who knows French technical terms. What I want is a boy who can read, write, and speak French. We will teach him the technicalities. If he is intelligent he will pick them up in a month; but we cannot teach him the language." Secondly, the school must teach subjects which will train the intellect. That is a foregone conclusion, and we must remember that the schools alone can deal with boys who are entering offices as clerks. They have to enter service early, owing to the exigencies or demands of business men—demands which are translated into "exigencies of business," though I don't think that the two are necessarily synonymous—but I am afraid we are very much in their hands in that matter. Next, we come to the work of the University—the work of the University should consist of the study of the essential science of business; a study of general Economics, a study of particular Economics, of the movement of business in various parts of the world, say, in South America, if you like. It involves a study of the theory and practice of exchange, which is one of the most highly developed, and one of the most difficult, of the branches of special Economics. There should be courses dealing with the history of particular businesses, and showing what principles have governed their development, and in what directions. You also need courses dealing with the effect of geographical conditions on trade, which is a most important thing, with the general effect of the geographical features of a country upon its trade development. You also need statistical instruction, mainly with a view, not of cramming statistics or of merely knowing them, but of learning to handle them, and to appreciate what a certain class of statistical facts really means. The student should be taught to handle statistics, so that he may subsequently be able to handle other statistics in practice, that he may not be deceived when he comes across statistics, where otherwise he might be deceived. I think study of that kind should be with two objects: first, in order that from a knowledge of the past you may argue as to future opportunities and future developments of business, and when changes occur to at once take advantage of these changes. A boy who realises how trade has changed will realise how trade may change, and will be looking about for different openings and different opportunities. The second object is, of course, that from practical dealing with such matters as facts, he will be able, in future, to deal with new facts and new statistics, as they present themselves in the course of business. But of course that is all designed for a particular class of men. It is designed for a class who may have something to do with the management, not necessarily as principals, but as clerks holding important positions. Of course, information of that kind to the ordinary clerk—the clerk in an ordinary place fulfilling routine work—would be really thrown away. He is doing operations which give comparatively little opportunity for the exercise of intelligence, and none at all for the exercise of such special knowledge as I have suggested. It is of use for people who are going into business, into positions already found, or who could be passed into business as a higher grade of clerks. For them I think it would be important, and I conceive that their education could be carried as high as you like: just as high as in any ordinary branch of scientific or literary education. You can make it quite as difficult. I don't think we want to make it easy. You can test intelligence quite as thoroughly by it. All one really asks for is that kind of education in a University by which you should be able to develop the intelligence, through a medium which may be of importance in the conduct of business. It is not suggested that you should teach subjects on a low level, but that you should develop the intelligence of students,

by as high a test as possible, in a particular medium. If business houses saw the means of distinguishing between clerks who are to do the minor routine work of offices, and those fit to do the more important work of managing business, I believe such knowledge as this would be eagerly taken advantage of by them, as well as by the sons of principals; but as yet I am bound to say they don't seem to see their way to that, and that is a state of things which leads to complaints, as the following from business men: "We can get any number of clerks to do our office work; but if I want a clerk to whom I will pay £500 or £600 a year, to put in a position of responsibility and control, I cannot find him." Well, of course, he is not likely to find him if he expects that every clerk is to go through this same ordinary routine. What one would plead for, if one might plead with business men, is that they should not insist on a long period of unintelligent office routine as a necessary preliminary to positions of responsibility. We have left out of account the question of technical office routine, and the analysis of business operations. That seems to me a very debatable point, at present, in Commercial Education. I think that it is a great error to suppose you can supply that entirely by any technical instruction whatever. I think it is small in its quantity, and I think it is very easily acquired in an office. I believe a boy who is intelligent, whether he be a clerk going in at sixteen, or the son of a principal going in at twenty-one, after this long course of training, can pick up this technique in a very short time. I will illustrate the point with regard to one of our classes of Commercial Geography. The criticism was that the teaching was largely in general geographical features and general principles, and it was urged: "What you ought to teach would be the express companies by which you can send a parcel from Liverpool to Vienna." Now, that is information which, it seems to me, can be easily picked up and acquired in actual business. It would be a waste of time to acquire it anywhere else; it very probably would be acquired inaccurately in school, and in addition it would probably be changed every year. It is information of that kind which, it seems to me, no institution should attempt to teach. The only question is, whether an institution should take the analysis of business operations, teach business operations at all, and if so, how. I think they can be perfectly well conjoined with both systems for a certain purpose. I think it is well that in the Secondary Schools, which specially develop for Commerce, they should have some teaching of business operations, very slight, in order to keep before the students the kind of end to which they are to apply their knowledge. It does not profess to be exact. It professes merely to indicate the use to be made of the knowledge acquired. I think, in the higher form of education, the University side of which I have spoken, that is necessary, to some extent, because it illustrates the mode in which trade is really governed by economic causes. There should be a course to explain the nature of business operations, in order to understand the principles on which these operations are based. If you look at such a scheme as that which has been sketched out in Leipzig, in the Hochhandelschule there, you have intelligence of the highest kind, and you also have a very good class of analysis of business operations. There is no system there of students conducting mock transactions with each other. That is not the aim. In connection with this subject it is instructive to study the development of the Handelschule in Germany, where instruction in technique has always been subordinated to substantial education. The Handelschule is now developing into the Hochhandelschule. The general trend in Germany has been towards teaching of the very highest order. Within the last few years new institutions have been founded. There is one at Frankfort which has the very highest teaching. It is teaching which will take quite a University level, quite different from the old form of Handelschule. The Swiss to some degree, and the Austrian, to some degree, have been of a lower order, and so also has been the case in some parts of France, but not in the big schools in Paris. The big schools of commercial studies in Paris are of the very highest kind. They do not lay stress on the teaching of technique. I think we should distinguish then between Commercial Schools, which take this technique side, and the Commercial Schools which are aiming at the University ideal, and which are allying themselves with Universities wherever they can. In Cologne they have not got a University. In Leipzig they have, and there you get the combination. The distinction between the two kinds of education you can usefully give, is between the education enabling clerks entering business early with knowledge of the ordinary operations of business, and that which consists in a study of the operations and circumstances determining particular methods and particular developments, and which renders the mind alert, and capable of devising new methods and seizing new opportunities. A prominent defect of our English system certainly has been the hopeless confusion of those two kinds of education. The second defect is, that until quite recently we have been content with teaching a subject allied to commerce, without teaching it with reference to commerce. In teaching French we have taught French literature. We have not seen that the fundamental thing in business education is the reading and speaking of French. These are the two great defects. Of course, from what I have said, you can quite see what my own view is with regard to the position of the University. It is, that the University can only take part—that it should take part—in the very highest form of Commercial Education, and that it has opportunities to take such a part; and I believe, moreover, that work of that kind can be satisfactorily undertaken only by a University, or by an institution of regular University rank. Such education ensures the close connection between the highest Commercial Education and the liberal studies, and is desirable:—First, because you need in business a very high standard of general intelligence and disciplinary cultivation; second, because in Commercial Education of that type you are aiming at the discussion of ultimate causes from a true standpoint; and third, because by this association with liberal studies you escape the great danger of confusing such education with the education of technique, of which I have spoken. The scheme must not be overweighted with the mere knowledge of technique and of operations, the knowledge of which can be more easily acquired in business. Such an education, of course, centres round Economics and Geography. These are the two fundamental things. If we take our own case, the case of University College, Liverpool, that would mean a very large development in the staff. We have there a Chair of Economics, but we should require a Chair of Geography as well, and probably two or three additional Lectureships in Economics. We should also require the co-operation of a Professor of Commercial Law, a special Professor; and we should have to develop courses of instruction by men of practical experience in such subjects as Banking, Railway and Business Administration, and other matters. Such an undertaking would involve us—and this is an apology for our default—in very heavy expense. If we could get money to do it we would be perfectly willing to do it, and I think any University ought to be perfectly willing to do it, but it would be a very serious undertaking for us. I think that concludes what I have to say as to those three points—what we have done, the kinds of Commercial Education which might be given, and the kind of education which I think a University might rightly undertake to give.

5533. Mr. Justice MADDEN.—Some of the points in your very interesting evidence relating to the constitution of your Colleges in the Victoria University, suggest some questions of a wider range than those with which we are now immediately concerned. That information was important, and indeed necessary, in order to enable us to understand the exact position in Liverpool. Coming now to the position to be occupied in a University course by commercial studies, I desire to ask you one or two questions. I conclude from your evidence that the success of such a course depends largely upon the view taken of its utility by the commercial community?—I think so.

5534. Up to the present time I conclude that, except by the passing of resolutions, which I might perhaps characterise as mere talk, they have not thrown themselves very warmly into the movement?—Well, they have given us money to do it; but our difficulty has been that the students, after passing through a course of which they themselves have approved, do not easily find situations. They are handicapped by age. There were two very good students recently who took the Liverpool School of Commerce curriculum. Last Christmas I approached a commercial man, and I said that the very best advertisement for the

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school would be that these boys, when they passed, as I was sure they would, should find situations open to them. They were not rich. They wanted clerkships, and were they going to find that the time they had spent in the school had hopelessly handicapped their commercial career or not? I am sorry to say that when they passed they did not find situations. They were, however, recommended to go abroad and acquire colloquial German, which they did, and have been doing for six months, and I hope they will be able to find situations, but, of course, they were only able to go abroad because the Lancashire County Council, from which they held Scholarships, kindly renewed the Scholarships for another year. But that did not strike me as very hopeful. No doubt we shall be able to get situations for them, but it means a considerable amount of trouble and anxiety, both on their side and ours. That is not the kind of practical help which I consider should be given by commercial men to encourage boys to go in for this class of education.

5535. But the encouragement in the long run must rest on motives of self-interest?—Yes.

5536. You must show them and persuade them that it is their interest to employ men of that class for the higher positions in their offices?—Yes.

5537. This whole idea of higher Commercial Education of a University type is of very recent growth?—Yes.

5538. Therefore, it is not surprising that up to the present it should not have found acceptance among the commercial class?—I don't think there is any reason for complaint in that. My only feeling is that these two boys, after being educated, not under the scheme which I should be anxious to see developed, but under a scheme of a more intermediate character, which had been approved by some commercial men, should find themselves handicapped by the time given to this education.

5539. What you would look forward to ultimately would be the practical recognition of two classes of clerks—I don't mean the technical division of classes as in the Civil Service, into higher and lower—but that it should be practically recognised that there were two kinds of clerks, those who might enter a practical business office at sixteen or so, having received a training in a Secondary School; and those of a higher class, who might at once obtain a different position, somewhat more important, and who would have the advantage of University training?—Yes, I would put it in this way—those who would enter into business with the immediate prospect of being promoted to such positions. They might have to do ordinary routine work for a year or six months, but would then be promoted to another kind of work. I quite think that. Failing that, it seems to me that the only people to take advantage of this higher system of Commercial Education would be the sons of principals themselves.

5540. That I quite understand, but the acceptance of this principle by the commercial community would depend upon, and be consequent upon, the establishment by the Universities of a satisfactory course leading up to it?—Certainly.

5541. And if a satisfactory course were established by the Universities you are not hopeless about it?—I am not hopeless about it. Our own experience, which has been in quite a different grade, has not been very successful, but I think we have learned a great deal from it.

5542. In the case of the second class of students, those who will themselves become employers, and will be the leaders in Commerce, you regard a liberal education as important?—Certainly.

5543. The kind of liberal education which you think would be most suitable for them would be a University one, in which the higher Commercial Education, especially the study of Economic Science, should form an important part?—Yes, that is exactly my view. That it should be really a liberal education, but a liberal education in a particular branch of studies; and, as to Economic education, perhaps I should explain that I should like the Commission to be aware that I am not advocating as sufficient the study of Economics as carried on now.

5544. I was going to call your attention to that circumstance. There are Professors of Political Economy in Universities, but of Political Economy as a Science, and not in special relation to Commercial education?—Perhaps I had better describe to you my work as it stands. I take two classes a week in Economic Geography. I take a class in Economic History, which is practically History, regarded from an economic point of view. Then I take a class in General Economic Theory for two hours a week, and I take a class in what is called Descriptive Economics, which is Economics as realised in business, for one hour a week, but, of course, that is a side that would have to be developed very much in any scheme such as that suggested. It is that latter side I am anxious about. Economics should be taught, not theoretically, but, to use the German term, "realistically." It should be taught in two ways: You should not only have a realistic course, but you should have realistic laboratory work, a statistical laboratory, where there would be collating and working on statistics, just as work of another kind is done in a scientific laboratory, as an exercise for the mind of the students, and as a means of training them to realise statistics and other facts connected with Commerce in a scientific manner. This can be done with statistics and also with Geography. Of course, in such a school as I describe, I might take myself the General Theory class and one realistic branch. I might take the realistic branch of the exchanges, or the growth of trusts and monopolies—some special branch. Then other branches would be taken by other men, and there would be also what I have called the laboratory work, which would be a practical development of Economics as a realistic study. There is a certain difficulty in the study of Economics. People, as a rule, are too anxious to get to a final theory of things in Economics. In this respect it is possible to distinguish between Economics and Natural Science. Everyone, more or less, has to have some working theory of Economics. Everyone has not to have a working scientific theory which is vastly to the advantage of Science, inasmuch as you have not to make up your mind too prematurely. At any rate, everyone thinks he has a right to have an Economic theory, and that seems to have led to the attempt to have what I might call a premature final theory of Economics. Of course, we must have some broad theoretical principles, but, in my opinion, Economics is a study in which we have very much to learn before we can develop a final theory.

5545. With reference to men belonging to the commercial classes, many of whom find their way into the legislature, I presume that a sound economic training, based on what are usually regarded as sound economic principles, would be no disadvantage?—I think it would be a very great advantage. I would certainly include in such a school the teaching of the social side of Economics, and I think that such a branch as local finance and local administration is peculiarly susceptible of quite definite sound economic handling at the present time.

5546. Is it your idea that this higher commercial course should lead up to a separate degree or diploma in a University, or that it should form a constituent part of an Arts course?—I certainly think it should lead up to a degree.

5547. Should that be the ordinary Arts degree?—It might lead up to an ordinary Arts degree, a student being allowed to specialise in it towards the end of his course, by being allowed to substitute the subjects I have mentioned for Latin, or Mathematics, or some of the ordinary constituent parts of an Arts course. The degree would be the degree of Bachelor of Arts; but the student would, with a view to his future, have specialised during the latter part of his course in that branch of subjects. That is one alternative. The other alternative is that the University should give a special degree, whatever its title, whether Economics or Commerce, but that the student aspiring to that degree should carry on his Arts course up to a certain defined point. Of course, he would matriculate, with an examination in Arts, and, possibly, carry Arts up to an Intermediate examination.

5548. Which of those alternatives do you prefer?—I have no distinct preference for either, as you have defined them. On the whole, I prefer an ordinary Arts degree, at least so far as the main part of the course is concerned. Even that will entail considerable options both in the intermediate and final stage. If we took our own case in Victoria, of course the student can at his final stage take Economics in an Arts degree, but he takes it so as to serve for one of four subjects. He can also

take, as a half subject, Economic History, so that is one and a-half out of four subjects. But in a scheme like this he would have to take more; still I would prefer the association of commercial with liberal studies, for two or three reasons, which seem most important at the present time. The first is, he would not in that case run the risk of overweighting his education with what I call the technical matters of commerce. They would play their part in his preliminary course; but it would be a minor part. The second point is, I think that the degree of Bachelor of Commerce would, naturally, excite derision, and, I rather think, rightly so. People would say that such a man should necessarily be a successful commercial man; but actual success in commerce must depend on a great many other things besides acquirements. There may be a defect in the nature of the man. He may be incapable of promptitude or decision, and that, of course, would seriously hamper his success in commercial life; and thirdly, I would like it to be associated with liberal studies, because I consider it is essentially a liberal study, and not merely a technical study in the technical sense, just as in the very highest form of Technical Education you come to Science.

5549. Perhaps the title of Bachelor of Commerce might not be a felicitous one; but the second alternative might be put in this form—a special course, with a distinctive degree, regarded as an attraction to employers to select clerks, as you have pointed out, from those who had specialised at the University in that particular branch of education?—That might be better in some ways.

5550. Possibly you may not have thought it out; but I wanted to know your opinion?—My preference is for an ordinary Arts degree as the most practicable. We were discussing this at a Committee of the Victoria University only the other day. Everyone felt, I think, that the inclusion in an ordinary Arts degree was desirable in itself, but the great difficulty was how to leave room in it for other subjects, besides one or two Languages, Economics, and Geography, and Commercial Law. That in itself makes a pretty good group of subjects. Then it was suggested that it would be better to have an Honours School, with which, of course, it would not be inconsistent.

5551. That would not be inconsistent; and in that way you might meet the difficulty: if a medal, or Honour tripos, were instituted in that particular department it might carry with it the Arts degree?—I agree; if I were sketching out an ideal University, there should be both an Honours degree and an ordinary degree.

5552. Most Rev. Dr. HEALY.—I wish to ask one or two questions with regard to the relations of the University to the Colleges. You have given us a great deal of information with regard to the matter already, but I just wish a little further elucidation. I find a reference in the Charter to University Professors and University Lecturers. Are all Professors of the University College, Liverpool, University Professors?—Necessarily. Your acceptance of a Professorship involves your becoming a Professor in the University. The Professorship in the University, as a distinction, does not carry any salary with it. It is merely an acceptance of you as a Professor in the College.

5553. Has the University any check over the College in the appointment of Professors—over the appointment of an incompetent man?—None whatever.

5554. By the mere fact of the College appointing a Professor he becomes *ipso facto* then a Professor of the University?—Yes. When I said it has no check—it has not in practice, certainly. Whether it could refuse to acknowledge a man legally I am afraid I cannot state. It has always accepted, without any difficulty, the appointment in every case.

5555. I was anxious to know that point, in view of the possibility of a similar case, where the College might appoint an incompetent man, and the University authorities would have to accept him?—Just look at the Charter,, Clause XV.,* where it is legally determined: "Professors of the University shall be Professors of the College or Colleges in the University, who are members for the time being of the Senate, or Senates, or the Academic Board in the Colleges." So that any Professor in the College is necessarily a Professor in the University.

5556. As a matter of fact, the University has no check on the appointment of an incompetent Professor?—No.

5557. The University has authority over the Colleges in regard to the duration and character of the studies?—Yes.

5558. They have authority as to the duration and character of the studies that are required of students of the Colleges as a qualification for the University degree, and therefore the University has a considerable share in arranging the courses?—Certainly. The courses are submitted every year to the University, and the University can say this course is sufficient, or not sufficient, for attendance qualifying for admission to such and such an examination.

5559. And in the matter of the conduct of examinations it has a right to appoint external Examiners?—Not only has it a right, but it is compelled to appoint them.

5560. These, however, are the two principal points of contact between the University and the Colleges?—Yes.

5561. Where are the examinations conducted?—The examinations are conducted in the separate Colleges both in the case of written examinations and oral and practical examinations. That involves the external Examiner coming to the respective Colleges, in the case of oral or practical examinations.

5562. Are there the same set of papers in all the Colleges, or are they different?—The same papers are set in all the Colleges, and the examinations are held simultaneously at the same hour.

5563. Is that found to work quite satisfactorily?—It works perfectly easily. There is no difficulty whatever.

5564. Mr. Justice MADDEN.—You are speaking of the University examinations?—Yes. The University appoints in each College a supervisor of examinations from the College staff, and he has to undertake the giving out of papers and dispatch the answers of candidates to the Examiners.

5565. Most Rev. Dr. HEALY.—With reference to prizes, I suppose there are Collegiate prizes and University prizes?—Yes; Collegiate prizes and University prizes; Collegiate Scholarships and University Scholarships, and so on.

5566. The Collegiate prizes are awarded on the results of examinations conducted in that particular College?—Some of them are, and some of them are given under special conditions. For instance, there is what we call a Declamation prize. That has nothing to do with a University examination; but we have often awarded prizes and rewards on the results of the University examinations. Some of our Scholarships, for instance, require that the Scholar must have taken a certain University distinction.

5567. But with regard to the University prizes, they are inter-Collegiate?—Yes.

5568. And decided on the results of the examinations of the three Colleges?—Yes.

5569. And in case of the Fellowships and the other prizes, do they hold examinations distinct from the examination of the graduates?—I think the Fellowships are awarded on the Honour Schools. In some cases a Fellowship necessitates a thesis.

5570. The examiners send in a special report on the result of the examinations of candidates for these Honours. The University elects, having regard to that report?—Yes. There is a committee, which meets to select and determine who shall be recommended.

5571. You pointed out very clearly the advantages and disadvantages of a federal University working with the Colleges. I don't know whether this is a fair question to ask or not—but would you undertake to say, taking both sides into account, that the disadvantages more than counterbalance the advantages?—It depends entirely on the particular stage of growth of the College. In our own case I have not the slightest doubt; but if I had been asked the same question twelve years ago, I should have returned a different answer. It depends entirely upon the efficiency of the institution. When an institution has become efficient, and has accumulated a substantial body of teachers capable of giving University instruction in the various subjects, then I think the disadvantages greatly outweigh the advantages; but otherwise, I think the advantages of the federal system are obvious.

5572. You point out that the question of distance has to be taken into account, and that sometimes, with regard to University meetings, especially when two Colleges are geographically a considerable distance apart, it is a grave disadvantage?—There is no doubt whatever that the greater the distance the more the University tends to become an Examining Board. It is quite

* The Victoria University Calendar for the year 1901, page 31.

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obvious it must, more or less resolve itself into that, if the distances are great, and in such a case the result must be that the teaching will be really regulated by the examinations.

5573. Suppose you had two University Colleges, and that the tendency in one of the Colleges was towards the scientific side of University Education, or, to what I might possibly call the technical side, and that in the other College the tendency was rather towards the literary and professional side, do you think these would work satisfactorily on the federal basis—would they work as satisfactorily as if the tendency of both Colleges were in the same direction?—I should think it would be better if the tendency of the Colleges were in the same direction.

5574. Because then you would reap more mutual advantages?—I think so.

5575. They would be more likely to work in harmonious union as federal Colleges?—Yes. They would be more in contact.

5576. At present I understand there is something like an agitation, in Liverpool, in favour of your getting a University of your own?—Yes. The Council of the College passed a resolution last Easter stating that whilst they acknowledged with great gratitude the services of Victoria University in earlier years, yet they thought the time had now come for the establishment of a separate University. That has been very effectively supported by the public, and it has also been supported by the City Council.

5577. You think the establishment of such a University would be more likely to receive the generous support of the people of Liverpool?—Certainly; it would be more effective both in obtaining students, and also in obtaining sympathy, and will give us an opportunity of developing with less difficulty the particular directions in which our teaching tends.

5578. Do you think that the feeling of having a University of your own in Liverpool is intensifying rather than the reverse?—It is increasing very much. The feeling has been of comparatively recent growth, but it is strengthening now very much.

5579. It is growing?—There is no doubt about that.

5580. I suppose the example of Birmingham is likely to stimulate that feeling?—It has stimulated it.

On resuming, after an interval,

5581. Professor LORRAIN SMITH.—With regard to the constitution of Victoria University, there is one question I should like to ask you. The fact that a Professor is an Examiner is no disqualification for a seat on the Council?—None whatever.

5582. Elsewhere—I don't know whether by custom or by statute—it is regarded as a reason for their not sitting on the Senate of the University, that a man cannot be a Senator and an Examiner at the same time. Have you, in the Victoria University, had any experience which would justify that provision?—None whatever; quite the contrary.

5583. That is to say, you would regard the efficiency of the Council as increased by the Examiners having a representation on the University Senate?—Certainly.

5584. In speaking of the development of the University College, Liverpool, you mentioned the local sentiment and the sources of revenue. Might I ask you to amplify your statement regarding the conditions which justify you in Liverpool in proceeding to this new development?—I think that the conditions which justify us in asking for a University would really be summed up in our extremely rapid growth and development, both on the Arts side and the Scientific side, within the last few years. Within the last ten years we have developed very much, indeed. I remember the College when I came to it, and I know it as it is now, and the growth which has occurred in twelve years in efficiency, variety, interest, and extension of teaching, is, to my mind, so very great, that I think we have really overcome any possible objection there could be to our holding autonomous University rank. The condition which justifies the College developing into a University is the provision of substantial high teaching in a substantial number of subjects. I don't think it desirable that there should be a University consisting of one faculty alone. I think it ought to have several faculties. I don't say you should have all. I think you should have several faculties, several subjects, and that in those subjects you should be able to show evidence of high teaching. That we feel we can do. At the present stage the Senate would not feel any hesitation in demanding a Charter. At the same time, we are extremely anxious that when we do start as a University we should start, so to speak, with a clean slate, so far as finances are concerned, and also, that we should be more thoroughly equipped in certain subjects than we are now, in order to be able to relieve individual teachers, and give them an opportunity of developing more the research work of themselves and of their students.

5585. You mentioned the Arts Faculty first, in your statement?—That was because I was thinking of it as, in some senses, the senior faculty, and because I happen to be a member of it.

5586. I would like you to develop that idea. You regard it as of primary importance?—No, I would not say that. The Faculties of Arts and Science I regard as of equal importance. Taken as we constitute them, those include the main branches of what you would call scientific and literary research taken as branches of knowledge.

5587. In what has your success in the Arts Faculty consisted?—In the increase in the number of students, increase in the number of the staff, and in the character of the work undertaken by students. We have now more students who are capable of appreciating research, and of understanding what research really means. Of course, I need not point out to the Commission that a provincial city is extremely handicapped in Arts research. We lack a sufficiently comprehensive library, though we are doing our best to extend the library. It has been enormously enlarged during the last eight years.

5588. Dr. STARKIE.—Has it got an endowment?—No considerable capital endowment; but Mr. Henry Tate gave us a building for the library, and a large sum of money to be expended on books. We have a small library endowment, and we have two or three special library endowments for special departments; but our library funds are not at all what we should desire them to be. We have a very considerable quantity of books; but still it will be a work of years, and will require an enormous expenditure of money, before we can attempt to vie in any department with libraries like the Bodleian and Cambridge University Library, or the British Museum.

5589. Professor LORRAIN SMITH.—Roughly speaking, what does that involve?—It involves an expenditure on a skilled librarian and assistants. We have a librarian and an assistant; and he has necessarily a boy, and we require to have an expenditure on books.

5590. About how much?—I don't know. There are several funds. I don't think we spend more than £200 or £300 per annum. I should like to spend about £1,000 a year on books.

5591. In regard to the curriculum in Commerce, as sketched out, with which I am in entire agreement, so far as my scanty knowledge of it goes, I would like to ask this. I have heard the request of some merchants interested in this subject that Science should be taught. I notice there is no direct teaching of Science in the curriculum?—When I sketched it I was referring to the substantial nature of business, and the conditions on which business depends; but I quite think that if you are to arrange an ordinary course for an ordinary degree you would have to add to it the teaching of Languages, and where Science is desirable in a particular business, the teaching of it; and up to the Intermediate stage there is no doubt whatever, in my mind, as to the necessity of teaching Mathematics, because of its enormous educational value.

5592. You have drawn a very sharp distinction between the Science of the market and the Science of the manufacturer—the curriculum which you have sketched out deals practically altogether with the Science of the market?—Yes; I think it mainly deals with business as distinct from manufacture.

5593. Do you insist on that?—No. I think if a town felt that the two were closely interlaced, that in that case it would be wise to interlace them. In Birmingham the interlacing is exceptionally close. Birmingham is almost entirely an industrial city, just as Liverpool is almost entirely a commercial city.

5594. Do you think the curriculum for a commercial man should include the subjects which manufacturers require, or should they be covered by technical institutions?—It depends on the extent. If you mean a

sound technical knowledge of a process such as a chemical process, I think that could hardly be included in a commercial degree or course. That would, so to speak, absorb almost a man's entire time. If he goes for a training in Applied Chemistry, and, just the same as if he goes for a training in electro-technical work, that practically would leave room only for the very closely related subjects, such as Mathematics, Pure Physics, and Pure Chemistry. I don't think you could include a too technical training in the curriculum.

5595. A distinction has been drawn between technical and technological, technical meaning the training in a school, and technological the training in the Sciences of Chemistry and Physics, and such subjects; and it is said that for Leeds and its industries the training should be technological, as an introduction to business, and that it should be on a University plane. As I have had it presented to me, I think that practically the two are inextricably mixed up—the technical and the technological—and I want your opinion as to whether they could be separated?—I think you must separate the technological, if you take it in that way, from the commercial. I quite see that for the commercial course you might need a certain amount of chemical knowledge; but a technological course would not leave time for such a course as you suggest, and a commercial course would not leave time. They could be taken successively; but that would involve five or six years.

5596. What number of years does this course involve?—I thought of a three years' course; but, wherever adopted you will have to allow the classes to be taken by persons who are not taking the entire course. I think there is no doubt about that.

5597. You spoke of the course being adapted to a certain class—the class for whom positions are already found. I suppose you would include in that the men who belong to co-operative businesses, where a man moves forward into partnership from, perhaps, even the lowest rank?—Yes; but if he has to go in at the lowest step is he sure of moving forward? If he merely depends on business chances of promotion, it seems to me that he will have to go to business rather too young. It depends very much on age, and the age limit is very sharply defined in commercial clerkships.

5598. May not those institutions which are managed on co-operative principles demand this education?—Certainly. Joint stock companies, private partnerships, and co-operative institutions, would alike all demand it in their management.

5599. Have you any knowledge of the position taken by London Chamber of Commerce with regard to Commercial Education?—I have seen their scheme, and hear that they take a considerable interest in the London candidates who pass the examination; but I don't know anything further about it.

5600. From the reports of meetings that I have read I gather it has been rather a failure?—I believe it is. I believe that several of the Commercial courses planned out under that institution have been unsuccessful. I don't think it has been widely taken advantage of. Most of the papers I have seen have not been sufficiently stringent.

5601. Apparently they had not, until quite recently, any provision for teaching?—No, they had not; and also, the London Chamber more or less allowed its candidates to take, at the beginning, any subjects they liked. They could qualify for the certificate on subjects which may, or may not, be useful; thus it seemed to be only Secondary Education competing with Boards like the Oxford and Cambridge Local Boards.

5602. The Royal University, as, perhaps, you know, gives its degrees, except in Medicine, without insisting on attendance at any classes?—I was not aware of that.

5603. You can come up from private study, from a private institution, or anywhere, and you are accepted for examination?—I was not aware of that. In Medicine, I suppose, the difference is owing to the General Medical Council?

5604. Yes. The regulation does exist with regard to Medicine. How would you look upon that as regards this new subject of Commercial Education?—I think that it is bad throughout. That is pure examining, as it seems to me, and not teaching.

5605. Would you abolish the examination altogether as regards external students—students who had not been educated in a recognised College?—Well, I think there should remain an external examination to some extent, but I am not anxious to encourage it as a system, and I would not encourage it in any system with which I was connected. It may be useful in exceptional cases.

5606. You are quite satisfied that London University should supply that?—Yes, we don't want to encroach.

5607. Professor LORRAIN SMITH.—This new subject of Commercial Education is not provided with text books, as other subjects, like Chemistry, are?—That is so.

5608. That would be a special reason for insisting on attendance at the classes of experts?—Of course, there would have to be attendance, as, owing to the lack of text books, students could not get through the examinations without attendance.

5609. There is a lack of text books?—I agree entirely. If you take any branch I have spoken of, with the exception of ordinary Geography and the general theory of Economics, there are no text books. My own class in Descriptive Economics has no text book. I have to give them a list of certain chapters from different books, and I have to insist on their taking very careful notes. There is no doubt that, for the course I have suggested, there is a great lack of good text books.

5610. There was another point about Commercial Education as to which I wish to have your opinion. Would you require, in the University course, that the man teaching Commercial Practice, say, the analysis of transactions, should be a man actually engaged in business?—I should regard that as indispensable. That is a very disputable point. Some people do, but my own experience is this: You have to select between a man with actual business experience and a man who can teach, and, of the two, the teaching is the more important, and the teacher may get up a knowledge of transactions. We have tried both. If you look for a man who has been in business, the question is, what kind of a man can you get. You cannot get a man who has been a great business success. Professorial incomes do not offer a sufficient inducement to such men. You are, therefore, thrown back on a man, who either has been incompetent or is rather crotchety, and thinks he can teach, or who happens to have met with misfortunes in business owing to lack of tact or decision of character. I don't think any of those classes would give what you might call a good teacher. We have tried them both. Just now we have a lecturer in the School of Commerce, who had some business experience, originally in Belfast, but for ten years he was in Leipzig in the Handelschule. He is an extremely good teacher. He tells me the Germans do not make this demand for actual business experience, because they realise that it is almost impossible. He is quite successful. In the same way we had a French teacher, who gave classes in commercial transactions in French with great success, but he had been very well trained in Paris before he went into business. We have had other instances where the class learned little, not because the teachers had no knowledge, but because they could not keep discipline, or could not impart their knowledge. I would not demand it, because I realise it is impossible to insist on it.

5611. We had a witness from Edinburgh who said that they insisted on having good business men, who took up the work of teaching on account of their public spirit?—Yes, but I don't know what the Commission thinks. Personally, I don't think public spirit will provide that kind of teaching continuously from year to year. I think it is intermittent. Of course, you may get a special course of lectures from a good business man, but the real work and stress and burden of teaching will always have to depend on a trained teacher.

5612. Of course this was only as to Commercial Practice?—Yes, but Commercial Practice goes on from year to year. A man won't mind giving a course of ten lectures on his special business, but he will probably object to teaching twice a week year after year.

5613. A course of lectures is what is in my mind?—A course of lectures you should certainly have from people of business experience. I thought you meant a Commercial Practice class, in which a man should go on continuously for a few hours a week for one transaction in business, and then for another operation, and insisting on the class stating to him what are the various operations that have to be gone through. Courses of lectures on a special subject are less burdensome, and make less demand on actual teaching capacity.

5614. I am extremely interested in what you describe as the laboratory work?—The great defects of Economics

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at the present time are their lack of popularity, and their lack of great utility owing to the want of practical work. I would have a department with at least three branches in it. One of them would have Commercial Statistics and Practice, another Social Conditions and Practice, including conditions in different countries, and another should have Geographical Practice and Study. Students would work in the department, just as in a laboratory, so many hours a week, and they should be required to work out the results like statistical clerks, and present the information formulated, not only because of the information which they would acquire, but because of the experience in handling facts and statistics which they would gain.

5615. In co-ordinated institutions like the Technological School and University College, it was stated to be essential that the salaries in both should be paid as salaries, and not by fees—have you any experience of that kind?—We pay all our salaries from certain fixed endowments, supplemented usually by two-thirds of the fees. Some portion of the fees is the usual practice existing in English University Colleges. As to the arguments on the one side and the other, I believe it is a fixed idea that the teacher will not work hard unless he has a certain interest in his work, to be derived from pecuniary considerations. That leads to a great many difficulties in practice, with regard to altering the curriculum. We have a difficulty in Victoria University in altering the curriculum, because it may interfere with certain teachers' fees.

5616. Dr. STARKIE.—You have said that in the Victoria University the examinations are conducted in the Colleges, but on the same papers?—Yes.

5617. I should like to know who are the examiners in the College—are they the lecturers in the College, with the help of a single extern Examiner in each subject?—They may or may not be. This year, for instance, I was taking Political Economy. Of course, it was only a written examination. I did all the examination, and took all the Manchester students, and all my own students. Leeds does not take Political Economy.

5618. The students of Manchester College had not the advantage of being examined by their own lecturer?—No, but we meet that difficulty in a comparatively simple way. The examination papers are laid before small committees, called Examination Committees. On each Examination Committee there is a representative from each College which is teaching, and they see the draft paper before it assumes its final form. The examiners and the teaching representatives from the College go through the paper, and the latter often say, "This question does not meet the syllabus which I have adopted for teaching; can you modify it in such and such a way?" I think that meets the difficulty.

5619. Has it been the general experience that the tendency of a mixed jury is to eliminate from the paper everything of an individual character. That is to say, a Professor does not care to set a question because it arises too directly out of his own peculiar methods of teaching, and consequently the tendency would be to set a number of colourless questions?—A certain painful monotony?

5620. Yes, that has been the unfortunate experience in many places?—Well, we usually set ten or eleven questions, and expect the candidates to do eight, and frequently I have known in my own papers, or papers I have had anything to do with, that questions have been left out which suited one of my colleagues, but which would not have suited the other. We have tried to meet that difficulty by setting ten or eleven questions, and expecting, say eight, to be answered.

5621. It is a difficulty?—Yes, I fully recognise it.

5622. Would not such a difficulty lead to the great objection to the federal system that you dilated upon, viz., that in such a University the teaching necessarily follows the examinations?—I think it is one of the difficulties. We have tried to obviate it by this enlargement of the number of questions, but I quite agree that it does lead to a lack of individuality in the papers.

5623. I daresay in your own subject—certainly in subjects like History and Metaphysics—it is of immense advantage educationally and in other respects also that students should be familiar with the methods of the examiner?—I quite agree with that. I know the History papers—I was trained as a historian—in Victoria University, and they are certainly open to the objection that they sometimes unindividualise the paper by putting in a great number of questions that would suit different people. It is rather a kind of rough justice.

5624. The general effect of this federation in the case of Liverpool has been that the greater the voice the College officers have in the examinations the greater the advantages of federation appear?—That describes the situation.

5625. Taking this country, we have had a system in Ireland of mixed juries rather different from those you have had experience of. Our juries are not only mixed in the sense that they contain representatives of various Colleges, but also in the sense that the denominations are evenly balanced on them, and the result has been a very considerable amount of friction?—That I should think would be obvious. We have not had that particular kind of friction.

5626. You are happier than we in that respect?—Happier in that respect.

5627. As you know, there has been in this country, consequently, a strong prejudice against federation?—Yes.

5628. Which prejudice has led to the demand for separate Universities, but, on the other hand, you are aware there is on the part of many persons a strong political objection and feeling against establishing separate Universities—would it seem to you that it would be possible to combine the advantages of separate Universities and of federation in this way—it is a solution propounded in the report of the 1878 Commission on the Scotch Universities. In that report the Commissioners expressed a desire that, without interfering with the autonomy of the four Scotch Universities, that still a certain amount of uniformity in the courses should be secured, and in the standard of degrees, and they suggested there should be a University Council, which should not dictate the courses to the Universities, but merely take measures that there should be a uniform standard, although not necessarily in the same subjects. The examinations were to be conducted, as before, by the lecturers or Professors in the separate Universities?—Was that without an extern? It is obligatory upon us to have an external Examiner.

5629. Applying that to Ireland, would such a Council, in your opinion, work well—a Council of Studies, which would supervise the courses of instruction in the Colleges, and take measures that they were of a high standard, but should allow the Colleges to conduct their own examinations with the assistance of extern examiners, and then, subsequently, on the results of the examinations conducted in the Colleges, give the University degrees. By means of such a scheme you free the teaching?—Yes. How do you supervise the courses of studies—do you have a detailed syllabus submitted, or would you rely on your general knowledge of the teacher?

5630. I should not object if the Council were composed of men who had experience in education, and of those who were qualified to judge, and if actual syllabuses should be submitted. I don't contemplate that in many cases the Central body would exercise their veto, but it is conceivable that in the case of a very weak College they would insist on the standard being properly maintained? It seems to me that is a way of obtaining a certain degree of the autonomy which you desire, but which you cannot otherwise attain, because you cannot trust your Colleges. That is really what it comes to. If you could trust your individual College, it is best to give it autonomy; but if you cannot trust it, give it as much autonomy as you can, and that plan would give it more, certainly, than the federal system.

5631. A great deal more?—Of course, freedom of teaching in certain subjects is more essential here than with us. In History and Philosophy you would, by that means, get the freedom you desire.

5632. The fact is, if Colleges situated in different parts of Ireland, which up to the present, under the Royal University, have been practically grinding institutions, get this autonomy, and if they are allowed to conduct their own examinations, it will be necessary to provide safeguards in order to satisfy the public, and a Central Council and extern Examiners are better safeguards than by providing uniform University examinations, conducted in absolute independence of the Colleges?—I think, of course, it would be a remedy to a certain extent, because you feel you cannot allow them to be separate Universities.

5633. Would you prefer that to the federation which you have enjoyed up to the present in Liverpool?—Speaking personally, the system of federation, so far

as the conduct of examinations in my own subject are concerned, has been singularly easy; speaking generally, I think the plan you suggest is to be preferred. I want to know how far the separate Colleges would be autonomous—would they have the privilege of conferring their own degrees?

5634. According to the idea which I have sketched out they would hold their own examinations with the help of an extern examiner, but when students had passed these examinations they would get their degrees from the central body?—I should have thought you would have an Inter-University Board, which would assist you in maintaining your standards while allowing each College to have practically otherwise full University privileges.

5635. This would give them full University privileges?—Then all the University Board would do would be to secure the equation of standards.

5636. Yes—to secure the confidence of the public?—That might be a solution. It might be necessary in your case. It is a second-best solution of the difficulty.

5637. The ideal scheme involves very strong Colleges?—Yes. With regard to Ireland, I should think there is no doubt the scheme which you have suggested would be preferable to a federal University.

5638. You think it would be preferable to our own particular type of federal University?—To any federal University. Ireland seems to be in a great difficulty as to a federal system—there is a very grave geographical difficulty.

5639. You have told us how you conduct the ordinary examinations by means of papers in the Victoria University. The Commissioners would be glad to know how you conduct the oral examinations?—These are in Science. I am at a disadvantage there, but what I know is done is that the extern examiner comes to each College, and goes through the students with the Professor of the College or lecturer of the College, whether that Professor or lecturer happens to be an examiner for the year or not. Then the Professor merely, as it were, guides the extern examiner to his own laboratory, and the real onus of arriving at a conclusion rests on the external examiner, who is, I assume, more important in the practical than he is in the written.

5640. But even in the written examination, is it true, as in the Welsh University, that the decision in any individual case has to be ratified by the extern examiner?—It has to be ratified to this extent, that each examiner, whether external or internal, has the right of veto on a candidate receiving less than a certain number of marks.

5641. The final result has to be sanctioned by the extern examiner?—He can veto it; he can veto a candidate. The internal examiner also can veto a candidate. The Board of Studies does not overrule the veto.

5642. Would not that veto be liable to some dangers, as the veto of the old Polish Parliament, in the way of blocking legislation?—It is liable to a great many dangers. I don't think it is always satisfactory.

5643. Especially when examiners come from rival institutions?—Any examiner may veto the candidate on his marks. The marks of a candidate must fall below a certain percentage before he exercises a veto, but the percentage of marks is at his disposal. We usually attain the marks by adding and dividing. If the marks fall below 33 per cent in most subjects—we take the third standards—any examiner, whether extern or intern, can exercise a veto. It may be unfair in certain cases. You cannot size up an examiner. He may not be a man of sufficient discretion in judging when he should exercise the veto. As a matter of practice, it is the habit of the internal examiner to subordinate his veto to the extern examiner. In the Welsh University, the practice is entirely different. The external examiner there is a very much more authoritative person. The internal examiner with us has the greatest responsibility in the examinations. But, as a matter of fact, we make it a point in Victoria to subordinate our decisions as to the veto to the external examiner.

5644. With regard to Commercial Education, there is one question I wish to ask: Are you in favour of specialised Commercial Education beginning at an early stage in the Secondary Schools or higher Elementary Schools?—Oh, most certainly not.

5645. There is great pressure brought to bear on the Intermediate Commissioners, sometimes, by business men, to introduce commercial subjects into the course, but I don't think, as a matter of fact, the Board have yet done so to any great extent. Some of us thought perhaps it might be well, in the History course, to make Commercial History an alternative for General History?—I think that would be unwise. In History the fundamental basis of History is General History, which includes Commercial History, and to suggest that you can study the Commercial History of a country without a reference to the political condition is undesirable. I could not so study it.

5646. And so with Commercial Geography?—Geography is, after all, a special application. You take geographical features and conditions, and show how these are important to the commercial position of a country; but if you ask me is it a good thing in any such schools to teach such subjects as Geography or Modern Languages, I say, it is, no doubt, of very great importance.

5647. But that is not Commercial Education?—Certainly not.

5648. On the Board of Intermediate Education we have tried to make the teaching of Languages practical by insisting upon a knowledge of them as actually spoken?—I feel strongly on that subject, and, I am sure, every member of the Commission would agree with this: that the primary object of education is to develop the intelligence of the students; and that in that respect the thorough teaching of Languages is most important.

5649. Has it been your experience that French or German is the more important?—There is no doubt that in Liverpool, Spanish and French are the most important languages. Liverpool is peculiarly concerned with trade with Spanish-speaking countries. French is the next important language. German is of very minor importance, partly because German-speaking countries do not form a great area, taking the world at large, and partly because very many German houses correspond in English, or can correspond in English.

5650. Professor DICKEY.—On that point of Languages, I suppose, in a large commercial centre like Liverpool, you have trade with all parts of the world—Egypt, and India, and so on—is there not a demand for Oriental Languages?—There is a certain demand for Chinese. We have had, for several years, a reader in Chinese. He is a retired Consular official from China, who was glad to take an entirely honorary position of readership; but students never presented themselves in sufficient numbers to form a class. While not ready to hold a class for one student, if a few came he would hold a class. He never got the few. If the thing were pushed there is a possibility of a class being held.

5651. Take Arabic?—There is great difficulty in obtaining a teacher for Arabic, except for the Biblical or literary side; Scholarship Arabic and colloquial Arabic are different things. In Manchester they have a Professor of Chinese at present, owing to a grant from the Technical Instruction Committee, and they are fortunate in having a Biblical Scholar who knows colloquial Arabic; but I do not know what classes there are.

5652. But in Liverpool there are openings for commercial situations where a knowledge of foreign languages is absolutely required?—Oh, yes.

5653. And these situations are filled, not by Englishmen, but by foreigners?—That is quite true.

5654. Could you give us an idea of the proportion of foreigners in situations of that kind?—I am afraid I cannot. There are a good number of foreign clerks in Liverpool, especially corresponding clerks. The number of correspondence clerks wanted are comparatively few compared with general clerks.

5655. University College existed before the Victoria University?—It existed before we joined the Victoria University. We did not join till 1884. The Victoria University existed a long time before any second College joined; but I forget the date of the Victoria University Charter. I think it was in 1880.

5656. Speaking of the endowments of your College, were those endowments obtained before the University was founded?—Some were obtained before we joined the University. A large sum was obtained for the foundation of the College, another large sum was subscribed to enable us to join the Victoria University, to give us an equipment in certain branches. Before we joined they insisted on certain provisions we were glad to fulfil; but since we have joined the Victoria University our benefactions have been quite equal to what they were before—I mean to say the increase has been as great. We had some very large endowments during the period 1885 to 1895, and we have now had

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a large endowment for our physiological laboratory, which cost a very large sum; and our new Physics laboratory will cost a large sum, which has been provided.

5657. None of these endowments are from Government?—Well, we have had, during the last ten years, or about ten years, a Treasury grant, which was given to the provincial Colleges—the University Colleges of England and Scotland—owing to representations made some ten years ago. That grant is revised every five years, after the Treasury Commission inquires into the condition of the College, and its financial position. We have just had an inspection by three Commissioners. Our Treasury grant recently has been £3,000 a year.

5658. Supposing you obtain a Charter for a separate University in Liverpool, you expect to obtain large private endowments?—We do. We expect a grant from the city. The City Council has passed a resolution to that effect, and private benefactors have promised money, and we expect large donations. We have not yet gone to the public with the scheme, but only to a very small circle.

5659. You don't propose to ask Government for any endowment?—We shall, I suppose, ask Government to give us a grant for carrying on University work, for conducting University business, and the appointment of Examiners; but such Charter grants are not large.

5660. You have no Faculty of Theology in Victoria University, at present?—No. We can, under our Charter, have a Theological Faculty. We have power under the Charter to give degrees in Theology. They are included in ordinary degrees.

5661. Supposing you get a Charter for a Liverpool University, I presume that that power would be given by a new Charter?—I think the only subject on which we need a special clause relating to degrees is in the case of Medicine, because it is a qualification to practise. As a rule, degree-giving power would be complete. You know that in England there are Theological difficulties as well as in Ireland, and I doubt if we shall be able to exercise our power in the direction of Theology. I am free to say that an independent Faculty of Theology is rather a matter for the future than the present. We do examine now, in our final degree, in subjects which may be called Theological. They are included in our ordinary Arts degree—Ecclesiastical History and Hebrew—and I hope we shall be able to include these, and add Arabic. But anything that admits of controversy would excite a great deal of popular feeling.

5662. You have the School of Technology in Manchester used by the University College there. Have you any similar institution in Liverpool, used by the University College, Liverpool?—What School of Technology?

5663. The Municipal?—It is used to this extent: the Owens College is in certain relations with the Municipal College. There has just been opened a Municipal Technological College in Liverpool, and we are very anxious that our relations with it should be harmonious. Our relations with the Municipality and Technical Instruction Committee are exceedingly harmonious, and we are anxious to devise means whereby there shall not be competition, but mutual assistance.

5664. It is to the benefit of both that there should be cordial relations established?—Yes.

5665. Apart from these three Colleges, no other College can present students for the benefits of the University?—For University degrees, no. Certain affiliated institutions are allowed to take students for the preliminary, and certain institutions may send in for technical diplomas and commercial diplomas founded on the slight nature of the work; but for the real benefit of the University degree none but Colleges can send in students. We have, in connection with the University, a University Extension branch, and, of course, a school examining branch; but those relate more to outside work than inside work. There is only one more point I wish to speak to. When I said provincial Colleges had to take people as they came, I meant on the parallel of the old Scotch Universities having to accept students in lower grades of knowledge, than they would desire. We endeavour to put them on the right grade by the end of their first year.

The witness withdrew.

REV. P. J. DOWLING, C.M., PH.B., St. Vincent's, Sunday's Well, Cork, examined.

Rev. P. J. Dowling, C.M., PH.B.

5666. Mr. Justice MADDEN.—I see you hold the degree of Bachelor of Philosophy?—Yes.

5667. Of what University?—It is a Roman degree.

5668. You belong, I believe, to the body of Vincentians?—Yes.

5669. You are in connection with the Department of Technical Education?—Yes.

5670. In what way?—I am a lecturer of the Department. They asked me to deliver lectures on Technical Education through this country, and, with the approval of the Bishops, I took up the appointment. The Bishops were anxious that the system should be put before the people by a person who had influence with them, and, with their approval, I took up the position of lecturer for the time being.

5671. You have a large experience in regard to Technical Education in Australia, England, and the Continent?—Yes.

5672. Bearing in mind that we are dealing here with Technical Education in reference to University Education, would you kindly give us any information founded on your experience, which you think would be of value to us?—I understand I need not speak of Technical Education in general?

5672a. No, except so far as it is connected with University Education, and it might be connected in several ways as leading up to it, in so far as the University might provide teachers of Technical Education?—My attention was first directed to the matter in Australia. For twelve years I paid close attention to the movement before it became practical on the English horizon. When my attention was fixed on the matter in Australia I was dealing with an English-speaking people, and, naturally, persons might say that the system of education that would suit the Continent, and, let us say, the nationalities of a different character from the Anglo-Saxon, might not hold so well with the English-speaking people. I found in Australia I had come on a ground particularly suited for investigation, for there I found that they were following out the German ideal regarding Technical Education, and applying it to English-speaking people. Hence I found I was favourably situated for studying the matter. I went about it in a practical way. I began to investigate in Australia whether the movement with regard to Technical training had really affected trade or commerce, and I found, just as we find now in every article on the subject, that the Germans were rapidly capturing the trade of Australia from the English, even though it was an English colony. In order to verify this observation, I went to some of the leading merchants—the Daltons of Sydney, who would be worth three or four millions of money. They are the largest importers in the Southern hemisphere. They took me round their stores and showed me vast masses of commercial products, that some years previously had been brought from England. Then, they said, they did not bring an ounce from England, for the simple reason that the goods were better and cheaper from Germany. As I went through the country I investigated in the different little bush towns, and there was scarcely a bush town in Australia in which I did not find the German products in evidence, both as regards chemical products, and also iron ware, clothing, and other goods, that did not seem so completely within the purview of Technical Education.

5673. There you came to appreciate the value of Technical Education?—Yes. I became a keen observer with regard to Technical Education, and then, naturally, I turned my attention to this system in Australia, and to begin with, the High Technical College, Sydney. I may say I knew the staff intimately. There was a magnificent Technical College erected at a cost of £200,000; a museum beside it which cost another £200,000. There was half a million of money in the two buildings, not mentioning the maintenance of the staff. Throughout Australia there was scarcely a town of importance in which you had not a Technical College.

5674. Were these connected with the Universities?—No. As a matter of fact, each College erected in sub-centres would cost £50,000. They were all controlled from the High College of Sydney.

5675. Professor LORRAIN SMITH.—Was that in New South Wales, or through Australia?—In each of the States, as we call them now. Then the Federation had not come in, but the same principle held through the other Colonies as in New South Wales. I am taking New South Wales as one instance.

5676. Professor DICKEY.—State-endowed Colleges?—Yes.

5677. Mr. Justice MADDEN.—Outside the University system?—Yes, completely. With regard to the working of the system, I remember distinctly asking Mr. Maiden, the head of the Technical College in Sydney, as to what relations were maintained between himself and the University, and he was very strong on the distinction between the work of the University and the work of the Technical College, and, in fact, he said he got no help, nor did he expect to get any from the University, the lines of work were so distinct.

5678. They were more like the Polytechnic Schools in Germany?—They are a combination of the different kinds of German schools. I have more respect for Sydney College now than I ever had, because they seem to have such a combination there. I visited some of the great Technological Colleges, and I found in those great technical centres that they are more for the training of the captains of industry, and the leaders in the different branches, than for the ordinary workmen, whereas I found in the Australian system they had what suited both. That is a combination, and I suppose, in one sense, it is a practical combination for a poor country. They are not able to spend all the money on working separate centres, and they combine the two things, and utilise the members of the staff for one department or another when the occasion requires. What convinced me of the necessity for keeping the two educations distinct was this. I have some argument from theory, but have also the fact that there was the Sydney University magnificently endowed—I don't think I am wrong in saying that the annual endowment of Sydney University is £40,000—with splendid buildings, and yet the number of students attending it could not be more than 200 or 300. On the other hand, I have visited the Sydney Technical Colleges during night classes, and at the actual moment there were between 5,000 and 7,000 students in attendance, showing the vast difference between practical study and mere University study and education. From my own observation I have come to the conclusion that they should be distinct. My view is confirmed by the fact, viz., that in order to gather more students the Sydney University threw its halls open to evening students, and, with all that, the Sydney University was there in stately isolation and grandeur, with a handful of men wandering through its halls, while the other place was like a beehive, with 7,000 students.

5679. Is that as it should be?—I think so.

5680. Then the conclusion would be that Technical Education should be outside University Education?—Completely.

5681. You may be perfectly right as to the result of your experience, but it hardly aids us except in a negative point of view?—That is one of the questions.

5682. Quite so; your idea is that a University should not attempt Technical Education?—Precisely. I argue also from theory, that, in the first place, the ends of a University and a Technical College are totally distinct.

5683. Take the case you mentioned of Sydney. You have referred to the profession of electrical engineers. They are educated exclusively in the Technical School, not in the University?—There is the strong point in my argument. They have also classes in the University for Electrical Engineering, but the verdict of the practical students is on the side of the Technical College.

5684. Does not that rather lead to the conclusion that the University Education is deficient in that particular in Sydney?—They don't spare expense. They get the best men—they have splendid men in the Chairs.

5685. Working on your experience, and developing your ideas, would it not have been a wise thing for the University to utilise the Technical School, and, in giving a degree for Engineering, to allow attendance on lectures and work in the laboratory of the Technical School to count towards that degree—is there not a possibility of co-ordinating the work of a University such as the University of Sydney, with the work of the Technical School you describe?—Still my contention holds. I think that is merely rewarding the Technical College for work done in its own sphere. The University authorities will reward the Technical College by admitting their work to count for a degree.

5686. From the point of view of the public, and of the public funds, should it not be considered how the Technical Schools might best be utilised?—Yes. What I am afraid of is, from the experience that the training of the University is so totally distinct, you might have to spend a good deal of public money before you get the University to come round to that point where it would be ripe for practical work.

5687. The existing constitutions of most Universities being such as you describe, do you see any reason why the University should not adapt itself to the growing requirements of the age; and one of these is the production of men specially skilled in certain branches of industry, but with a general liberal education—do you see any reason why it should not adapt itself to that state of things, and be co-ordinated with the system of Technical Education?—I don't see any reason; but I think the thing is not feasible.

5688. You may assist us in a negative way by stating the difficulties that occur to you?—With regard to the end of a University I think every one will agree that the end of a University is to provide an aristocracy of intellect that loves learning for its own sake.

5689. That should be one end, and the principal end?—Yes. I have considerable experience in teaching. I was engaged for twenty years in preparing students for Universities, both here and in Australia, and I found that the students who were aiming at the practical turn of life, say, the doctors and lawyers had to go to the University to get the B.A. degree; but the dominant note of their remarks was that they felt it was compulsion, and only that they were forced they would never have entered the halls of the University.

5690. Don't you think that the compulsion was of a very beneficial type. Take the case of a lawyer. Don't you think a man is better qualified for practice at the Bar because he has a liberal education?—Precisely.

5691. And that if a young man going to the Bar does not appreciate that, the more compulsion you put on him to acquire that education the better?—But I don't believe that you further the end of the University by taking a number of young fellows there on compulsion. That is not the class of men Newman contemplated, when he gave his idea of a University.

5692. The ideal student is the man who loves learning, for the sake of learning, and who is not interested in such things as Scholarships, or even Fellowships, but devotes himself to literature from the pure love of literature. May I ask, how many of the students have you come across in your experience?—Not many, I am sorry to say, in these countries—not many in Ireland or Australia.

5693. Scotland may be different?—Well, the struggle for existence is so keen that, of course, in a great many cases a man must look at the practical side of life. It is common on the Continent for men and women to go to the University simply for the sake of the learning in the University.

5694. Don't understand me as undervaluing that class of students. I would do everything to encourage and develop them; but, looking at the matter practically we must recognise that compulsion beginning at school, I won't say with flogging, but, at all events, with moral suasion—compulsion directed towards learning is not altogether to be despised?—I fancy, with regard to a University, that when you are looking to the staffing of a University you must look to the ideal of the University. If the ideal is that high class of learning and the providing of an aristocracy of intellect you must provide your staff to meet that, and maintain it; so I think that such end and ideal of the University is against the spirit of the Technical College.

5695. The result is, you don't advise us, in any suggestion we may make with regard to the future of University Education in Ireland, to attempt to co-ordinate it with any system of Technical Education?—If my advice would be of any weight, I should advise the Commission strongly against that.

5696. By examining you we desire to obtain your opinion?—Yes. Another very important point regarding this is the religious element. Here we are at present, and what is the whole object and aim of the Commission? To meet the demands for a Catholic University.

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5697. Don't take that as an exhaustive definition of our functions. The object and aim of the Commission are to inquire into University Education in Ireland, and Technical Education in so far as it is connected with University Education, within certain limits?—The occasion is the demand for a University. The general idea is that there must be a Catholic University. Let us, for a moment, suppose you put in your recommendation that the Technical Education be subordinate to the University then—as part of the programme—you have a Catholic Technical College. I maintain there is nothing should be kept more clearly and more widely apart than Theology from Technical Education. As one of the Bishops remarked, there is no Theology in a wash-tub, or in an incubator, or a mechanical machine. There is no Theology there, and the more we hope to make Technical Education a success in Ireland the more strenuous we should be to keep politics and religion apart from it.

5698. That points in the direction of the suggestion, that Technical Education should not be a branch of teaching in a Catholic College. How does this suggestion commend itself to your mind? There is, in Dublin, the Royal College of Science, and the development or reconstruction of it is under consideration. You are aware it is a branch of the Department of Agriculture and Technical Education. Suppose that were the recognised school of technical instruction in Ireland, with a properly equipped laboratory, and all the necessary appliances for the teaching of Applied Science, would it not be possible for the teaching University Colleges or Universities in Dublin to avail themselves of the technical teaching provided by that College of Science, and thus the necessity would be avoided of incorporating into such College or University as you contemplate a School of Technical Science—your objections, I presume, are not directed against such a scheme as I have suggested?—They are not, with regard to that particular.

5699. Is that suggestion not rather in ease of the religious difficulty? Religious questions are not involved in the construction of electrical machines, or in chemical experiments—a man who is constructing an electrical engine need not trouble himself with such problems as "The Descent of Man," or "The Origin of Life"—he minds his own business; but he may obtain his education in branches of learning in which religious considerations do enter in institution A, or institution B—why should he not take up the technical portion of his training in a common School of Science?—Your suggestion is perfectly right if you suppose the University to deal with the special subjects you mention, and then at the same time to have another College for Technical Education.

5700. What I am assuming is this: that the University gives a degree in a subject in regard to which Technical Education would be essential. Take a degree or diploma in Engineering, for instance. There is a large and increasing demand for electrical and mechanical engineers. No person can be a properly trained and instructed mechanical engineer without a course of training in some technical institution. I quite understand your objections to having such a school in the College you contemplate; but I would point out that the University or College might confer a degree for the obtaining of which such training is necessary, and that there might be an association or co-ordination between the University and College of the highest type and the Technical School?—I admit the necessity for co-ordination.

5701. That is the point I want to bring you to?—I admit that completely. I admit there is a lamentable want of co-ordination in our educational system, but I am wholly against the subordination of Technical Colleges to University authorities.

5702. You would admit that the absence of a really efficient practical training in Science is a lamentable want in our educational system?—That is clear. Another thing I thought I would bring under your notice, viz., the unmanageability of a technical establishment in connection with the University.

5703. The suggestion I threw out removes that difficulty?—You don't contemplate the University having control of the Technical College?

5704. Not the sole control. The question might be fairly raised whether, if the University is interested in the College, and adopts its curriculum, it should be represented in some way on the governing body; but that is a matter of detail?—That is a point I wish to contend against—that the University would have control of the Technical College.

5705. I understand that; and don't understand me as saying it should have the control?—I can see at once, for instance, in the Technical College of Zurich—

5706. Give us the benefit of your acquaintance with Zurich, and the other places you visited?—With regard to Zurich it is a good instance of the case in point. First of all, the people in Zurich and the Swiss Federation intended to establish two distinct places—one a Polytechnic at Zurich, and another—I suppose more of a University character—in some other site. Well, the University fell through. They thought it would not be practical enough, and they established a magnificent collection of buildings at Zurich for a Polytechnic. In that Polytechnic they devoted some attention to Literature and Arts, and they insisted on a certain portion of the course being read. The University can allow, if they insist, the Arts course, or the Literature course, read in the technical, to serve for their degrees.

5707. That is not what is suggested. That is rather wide of the suggestion I brought before you—that the University should provide an Arts course so far as an Arts course is necessary, or a general literary education is necessary for a scientific degree, leaving the technical part of education to be taken in the Technical College. The Polytechnic institution you are speaking of is a thing complete in itself: unconnected with any University. There is no co-ordination there. In order to render the education complete it is desirable that it should not be purely technical, but should embrace some of the elements of a general liberal education, and that can never be attained, inasmuch as the thing is complete in itself, and giving the entire education within the walls of that College. But the suggestion I brought before you for consideration was one of co-ordination between a teaching College, mainly devoted to the higher branches of learning, and a technical institution; and I gather, although you have not come across it as an existing thing in the course of your experience, that you don't reject it?—I don't reject it. That is a saving of energy. Supposing a young fellow at the Zurich Polytechnic read sufficient of a literary course to enable him to enter the Medical College, the Medical College will accept what he read in the Technical College towards their course, or, suppose he changed his mind, thought he would become a civil engineer, his literary work in the Medical School would be recognised in the Technical College.

5708. That is the principle of utilisation and co-operation of institutions existing side by side?—Yes.

5709. Are there any other matters that you would wish to bring before us?—There is the question of manageability. Technical Education is new to English-speaking people. I maintain that a Technical College requires a big staff and big buildings. If you want to do things properly, you must have something like what is at Zurich. We found there, for example, a College devoted to industrial Chemistry—an immense building erected at a cost of £100,000—and another building devoted to Forestry and Agriculture, erected at about the same expense. Then we found another College devoted to experiments in construction materials, another devoted to experiments in Forestry, another devoted to experiments in Agriculture, and, in addition to all that, they have a meteorological station, an immense physical laboratory, and an electrical chemical laboratory. There must be in Zurich a main building which cost £200,000, and each of the side buildings another £100,000. The total cost of the buildings must be nearly £1,200,000. This vast aggregate of buildings requires a tremendous staff. I think the Professors' salaries amount to £170,000, not to mention other details. I maintain the unmanageability of the combination makes it not feasible.

5710. I understand you—don't suppose I am in conflict with you on that point. It would involve enormous expense, in whatever College or University is established in Dublin to supply fully-equipped laboratories and all the appliances for teaching these various branches of Science, but that points, not so much to the exclusion of these branches of Science from the University curriculum as to the adoption for the purposes of teaching these particular branches of the outside department of Science?—If the outside College could manage it. It must be independent then.

5711. I understand the point you make—the unmanageability for the University to do that work to the extent to which the Technical School can do it?—Precisely.

5712. And it would seem to follow—and I agree with you—that if this work be done at all it had better be done by adopting, so far as possible, the work of the Technical School, and by taking advantage of the costly appliances provided for the purposes of education there?—Provided they are independent.

5713. I understand you to make that point?—Another important point is the way the Zurich practical side has swallowed up the other. That is very interesting in Zurich. During the thirty-seven years that the report extends over there were 74 architects got their diplomas, 183 engineers, 171 mechanicians, 139 chemists, 181 Professors of Agriculture, 165 foresters, and there are only 159 Professors. These were those that got diplomas. It is a usual thing there for half the men only to take diplomas. Half of them never apply for diplomas. You must double these numbers to find out those who actually went in for these professions. You have only 159 men on the literary side who would be in that University against the vast array on the other side of men who went in for practical work. That refers to Swiss only. Then you have a corresponding number of foreigners. That is a good proof of how the practical side has swallowed up the theoretical side—how the technical side has swallowed up the purely University side.

5714. Professor DICKEY.—You said there is one way in which the University could help Technical Education?—The only way it could help Technical Education is this: I happened to meet one of the leading men in Copenhagen—a man of much authority on this subject. He had been for years engaged in one of the principal butter factories there, and was also a banker, and knew the pulse of the country from both standpoints, and he said the real success of Denmark was due, not so much to technical training by itself, as to the fact that the higher education of the people had prepared them for technical training. When any of the experts sent out a report notifying that anything was worthy of the farmers' attention, it was taken up in twenty-four hours through Denmark. It had not to go through a process of filtration. The people grasped at once any discovery made, and put it immediately into practice. So it struck me in that way University Education could help the other immensely, because our gentlemen farmers and the heads of big business establishments, and so on, having got a University Education, would be more ready to accept the discoveries. In that way, I say University Education will help the development of Technical Education. In fact, at present in Ireland the whole trouble is to get Technical Education filtered through the people because they are not raised to a sufficient standard. I have here the "bill of fare" of Darmstadt, one of the great high schools in Germany, showing the eminently practical character of the teaching. It is one of the ten high schools built in Germany to meet higher Technical Education. There is one more point—the feasibility of the technical system. I think that is an important point.

5716. Mr. Justice MADDEN.—Feasibility is always an important point?—You see in Ireland one of the troubles regarding any system of Technical Education would be the providing of buildings, which would necessitate, of course, a great expenditure. We have scattered over Ireland at present buildings admirably suited for a lower grade of Technical College, viz., the Model School buildings. They have practically ceased to avail for the purposes for which they were instituted; they were models of anything but efficiency, and they used not pass as many pupils in proportion to numbers as were passed in the non-Model Schools.

5717. You think these schools might be utilised for technical instruction?—Yes, for trade schools. Coming from Cork, I was naturally asked to say something about the Queen's College there. I think the feeling of the Cork people would be that to deprive them of the Medical School would be a serious blow to Cork, because many a young fellow, who would have no chance of getting a medical education, can get it cheaply, and at his door, in the Queen's College, but as for the rest of it—the Engineering School and other departments—they are doing practically nothing. That building would be a magnificent one as a sub-centre of Technical Education. So if the Commissioners were making any recommendation, they have buildings ready to their hands in the Model Schools, and, in addition, in the Queen's College, Cork.

5718. The same recommendation applies to Galway?—Yes.

The Witness withdrew.

ARNOLD F. GRAVES, Esq., B.A., Secretary to the Commissioners of Charitable Donations and Bequests for Ireland, examined.

5719. Mr. Justice MADDEN.—You hold the degree of M.A. of the University of Dublin?—I never proceeded to it. I am only a B.A.

5720. You are a graduate of the University of Dublin?—Yes.

5721. You are Secretary at present to the Commissioners of Charitable Donations and Bequests?—Yes.

5722. I am aware you have for a great many years given special attention to the question of Technical Education in Ireland?—Yes.

5723. You were Honorary Secretary of the Dublin Technical School, and you are at present Honorary Secretary of that School?—I have just resigned. I was Honorary Secretary since 1885 up to the last fortnight.

5724. And you are Honorary Secretary of the Technical Instruction Committee of the Corporation of Dublin since its appointment ten years ago?—Yes.

5725. And Honorary Secretary of the Pembroke Technical School?—Yes.

5726. You are also Honorary Secretary of the Technical Educational Association for Ireland from its inception in 1894 up to the present time?—Yes.

5727. You are also Governor of the Royal Society for the Training and Employment of Women?—Yes.

5728. You have acquired a great deal of information and knowledge in connection with the subject we are now investigating, and we should be very much obliged if you give us the benefit of your experience and knowledge. In the first place, do you think that there has been in Ireland a want of proper scientific instruction?—Yes, I think there has been a very great want of it, and particularly as regards Science instruction of a University character. And although it might be thought by some to be beginning at the wrong end to suggest that a University should attend to this subject until the foundation has been laid in the Primary and Intermediate Schools, I cannot help feeling that it is a matter that might with advantage be taken up at once, because one of the greatest wants of those institutions with which I am connected, is the absolute dearth of Science teachers.

5729. Without going into detail, I suppose I might state as a general proposition that instruction in Ireland—Primary, Secondary, and University—has hitherto been directed rather to the literary and higher scientific branches of education than to the practical application of scientific teaching; in other words, higher technical instruction?—I think the education hitherto given in Ireland, whether Primary, Intermediate, or higher—has had the effect of leading the youth of the country away from the desk and the bench to the professions, with the result that our professions are overstocked, and commerce and industry has been, to a very large extent, deprived of the men who ought to have been educated to develop industry and commerce.

5730. There is a demand all through the world for properly-qualified mechanical engineers and electric engineers, and even in Ireland there has been a considerable demand for properly-qualified persons of that character. Are you aware a great many of those employed in Ireland obtain their education elsewhere?—There is no doubt whatever about it. If it were not for Scotch and English foremen, the mechanical and electrical engineering trades could scarcely be carried on in Ireland.

5731. I don't pursue that subject, though I know you could give us very interesting information, because I think you may assume that there is a consensus of opinion upon it?—Yes.

5732. You state in the Summary of your evidence you will submit a list of Irish industries likely to be benefited by technical instruction. That you will hand in, and we shall have it printed in our Appendix.* I

* See page 291.

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suppose you would look to technical instruction not only as a means of developing existing industries, but of creating new ones?—Certainly.

5733. I don't know whether your inquiry into the subject has enabled you to give us any instance of the creation of new industries as a consequence of scientific technical instruction?—I could give you one in Cork, and that is Harrington Brothers. Their works are entirely the result of Science instruction, which they received. Mr. Stanley Harrington told me that himself.

5734. What are their works?—Chemical works. I presume this Commission are aware of the fact that the principal industries in England, in which we are beaten by the foreigner, are the chemical trades, and it is generally admitted that this is in consequence of the superior training in Chemistry and its application to industry which they receive abroad. I don't know that I could give any other cases of new industries being created in Ireland, as a consequence of scientific instruction, but it was generally admitted, in the evidence given before the Royal Commission on Technical Instruction, that Technical Education had the effect of establishing fresh industries in other countries. People who are technically educated go about the country with their eyes open, and recognise its resources—raw produce, proximity to markets, and so forth, and with that special knowledge they are enabled to develop industries which the ordinary man would not be capable of doing.

5735. Therefore, the circumstances that we have not many industries in this country, so far from discouraging us from attempting to develop Technical Education in the matter of industries, is rather a reason why we should devote our attention to that branch of education?—I think so. Dr. Kane's "Industrial Resources of Ireland" points out a large number of possible developments of Irish industries.

5736. At the time he pointed it out, and for many years afterwards, the kind of education that would tend to the development of these industries was neglected?—Yes.

5737. So that it does not follow that he was a false prophet?—No.

5738. The conditions necessary to bring about his expectations did not exist?—Quite so.

5739. You call attention to the want of competent instructors in Science and technical matters: assuming we are convinced that there is such a want, how would you meet it? I presume you referred to that subject as a reason why the University should take up the matter?—Yes. There is a dearth of Science teachers—a legitimate subject for a University to take up. The question of technical teachers is a much more moot point, and on that subject I must say the question is full of difficulties, because your technical teacher—if he is to command the confidence of the working classes—must not only be competent to teach the principles of Science underlying particular industries, but must have a very extensive practical acquaintance with them; otherwise his theoretical knowledge would only make him laughed at. I have seen many instances, where men went out to teach subjects, in which they had certificates, and, rightly or wrongly, they did not command the confidence of the working men; and their classes were badly attended. With regard to the purely technical instructors, it is scarcely a matter for a University; on the other hand, Science teachers might be trained at the Dublin Universities, or at the Royal College of Science. They do a certain amount in that direction. Already at the College of Science groups of teachers attend courses during vacation. But it would be very desirable that they should make provision not only for Science teaching, but for instruction in the art of teaching.

5740. They are two distinct things—there is a difference between giving a man the information necessary to be a teacher, and turning him into a teacher?—Quite so.

5741. And you think special attention should be given to both?—Yes. I have had some experience of the teachers turned out by the College of Science, and my experience is that, although they are capable men, they are not always able to keep discipline and to impart their knowledge. I attribute this to want of training.

5742. They don't profess to teach Pedagogy in the College?—No. They merely give a higher instruction in particular subjects.

5743. You think Pedagogy might be a branch of University Education?—Yes. I know at the present time the Royal University and Trinity College have special examinations in Pedagogy, but not a faculty. It is one thing to examine in a subject, and another to teach it.

5744. You mentioned the Royal College of Science in Dublin. You are aware that it has recently become a branch of the Department of Agriculture and Technical Instruction, and we have been made aware that a scheme is under consideration for reorganising and developing that College?—Yes.

5745. Now you know no doubt that a very extensive equipment and apparatus are required for the teaching of Practical and Applied Science in accordance with modern ideas?—Yes.

5746. Supposing that the Royal College of Science were so equipped, does it occur to you that the College, reorganised and equipped, might be made available by teaching Colleges or Universities in Dublin for the purpose of affording technical instruction in Applied Science?—I think it would be desirable that it should, but, personally, I should prefer that this institution should be quite clear of the Department.

5747. That is another matter altogether. Quite apart from any question of government, if there were a fully-equipped laboratory and proper appliances for the teaching of Practical Science in a School of Science in Dublin, that institution might usefully be adopted by teaching Colleges or Universities in Dublin, in so far as their curriculum embraced a course of practical teaching in Science. You see there is an enormous expense in properly equipping a College according to modern ideas for a purpose of that kind?—A quarter of a million of money could be very easily expended.

5748. Yes. And quarters of millions of money are not to be had for the asking. And if a city like Dublin had one properly-equipped College for the teaching of Science in that city, the existence of such a central institution would render it unnecessary to re-duplicate these costly appliances in the various teaching Universities?—I should hope it would.

5749. Apart from any question of friction between the governing body of that College and the different Colleges or Universities availing themselves of its provision?—Apart from friction, it is very desirable that it should be done.

5750. If you could get rid of friction, it would be very desirable?—Quite so.

5751. A University giving a degree, either in Science or Engineering, might very fairly require actual attendance in laboratories and actual work in an institution of the kind?—Yes.

5752. Now, with reference to the constitution of the College of Science. As I told you, it has now become a branch of the Department of Agriculture and Technical Instruction. It was originally in connection with South Kensington, which is the popular mode of expressing that it was under the Board of Education in England. It was financed by money voted by Parliament, and is still?—Is still.

5753. If the institution were utilised by, and co-ordinated with teaching Colleges in Dublin, you seem to think that there should be some change in its present government or constitution?—Yes. I think it is undesirable that an institution in which the highest forms of scientific and technical instruction are, or ought to be given—an educational institution of the first rank—should be placed under the control of a body of clerks. As a matter of fact, the present Professors have little or no control over the institution.

5754. By a "body of clerks" you mean the Department?—Yes.

5755. The Department consists of some officials who are not clerks?—Yes.

5756. Your opinion is, that having regard to the nature and constitution of the Department, you do not think it a suitable governing body for an institution such as the College of Science, more especially if it is either affiliated with or utilised by teaching Universities?—Quite so.

5757. I imagine that would be your opinion quite independent of the *personnel* of the Department?—Oh, certainly.

5758. Quite irrespective of the *personnel* of the Department, you do not think it a suitable governing body for an educational institution of the kind?—It is right to state that, according to the Science and Art Directory, the Dean and Professors are supposed to be the controlling body with regard to educational matters; but it does not seem to me that they control them—that is, they do not decide the subjects to be taught, or who the teachers are to be, or——

5759. You are referring to the Royal College of Science?—The Royal College of Science.

5760. Professor LORRAIN SMITH.—Is the original constitution of the body in the Directory?—Yes. It is referred to.

5761. Mr. Justice MADDEN.—The former constitution?—Yes. The educational portion was under the Professors, of whom one was chosen Dean, and with regard to executive matters, it was supposed to be under the control of the Department, but as a matter of fact the Professors do not decide what subjects are to be taught, what faculties there should be; they don't appoint or remove teachers, and they don't settle their time table; and, therefore, it cannot be said that they are the governing body so far as educational matters are concerned. They can, of course, make certain recommendations to the Department; but on that subject I think it would be desirable for the Commission to ask whoever happens to be Dean, and he would give full information on the subject.

5762. You have opened up an interesting branch of the inquiry, Mr. Graves. I don't know whether you are in a position to give us any advice on the subject of the future government of the College?—The only suggestion I have to make about the government is an alternative suggestion. If there is to be a new teaching University, and if that teaching University is to be non-sectarian, in my opinion, it would be desirable that the College of Science should form a College under that University. As an alternative, I would suggest that it should be given a governing body of its own. Of course, the Department would have the power of the purse. But the College should be placed in an independent and respectable position. In forming that governing body it might be desirable to consider the expediency of appointing on it persons representing the Chambers of Commerce of Dublin, and indeed Belfast and Cork, because it is not a local institution, but is supposed to be an institution for the whole of Ireland. By doing that you bring it in connection with the industrial development of the country. It would also be desirable to place on the governing body representatives of other educational institutions, so that the various educational bodies might act in concord.

5763. There are two distinct suggestions: one, that it should form a constituent part of a new teaching University. If that suggestion were adopted it would naturally follow that this constituent part should be under the control of the governing body of the University?—Yes.

5764. The suggestion which I was throwing out was a different one—that it should remain a distinctly autonomous College?—Yes.

5765. Affording education of a technical character in its widest sense; and the latter portion of your answer was pointed to that suggestion?—Yes; the alternative.

5766. With the consequence that its course of instruction might be taken advantage of by whatever teaching bodies might be formed in Dublin or existed in Dublin?—Yes.

5767. You mentioned the word "unsectarian." I think it would be difficult to import sectarian instruction into the construction of steam engines or electrical machines. University A might teach its pupils some branches of Science in accordance with its views, and University B might regard those matters from a different point of view; and yet the course of instruction in the School of Science might be available, so far as it went, for University A and University B. There would be a third class of students, who took their entire course of scientific instruction in the College of Science?—Yes.

5768. And for the purposes of those students the general course of Science would be available. You say: "If a new teaching University or Colleges are to be established in Ireland, I would suggest that the following new faculties might be established—Mechanical Engineering, Electrical Engineering, Chemical Engineering, Architecture, Economics, or Commerce, and Pedagogy." Now, with regard to all those faculties, with the exception of Pedagogy, the suggestion which I have thrown out for your consideration would be material. I mean, that the College of Science should give instruction in each of those departments?—Yes.

5769. The degree in the University would probably not be allocated to it?—Yes.

5770. And probably there would be a certain amount of education in Arts and a certain amount of general training required for the University portion of the curriculum?—But the University would recognise the teaching at the third institution, and would recognise their certificate, as it were, as part of what they required, in order that they might grant the degree of B.Sc., for example. If that could be worked out without undue friction, I think the proposition has a great deal to be said in its favour. But, perhaps, you allude to the idea that it would be possible to use neutral laboratories and class rooms by different teachers, and pupils of different institutions. If that is the idea in your mind, my lord, my experience is that it would not work.

5771. The alternative suggestion would be that the laboratory should be in the College of Science, and that the Professors from the different institutions should go there. The idea I was throwing out was a different one—namely, that the same course of instruction should be utilised by the different students. The other scheme would require two sets of apparatus?—We have tried it in Kevin-street, and it led to the greatest friction between the students.

5772. I will now direct your attention to the establishment of these different faculties. To what extent would you say they should be different faculties. Would you propose that there should be degrees in each of them?—Not exactly. The Massachusetts Institute of Technology, which have the reputation of being the best in the world, have separate courses mapped out for each of these branches. I don't mean they have separate teachers for each subject in each faculty, but their curriculum for Mechanical Engineering is arranged on different lines from Mining Engineering or Chemical Engineers. To that extent it would be a different faculty; but you would have certain Professors who would teach in common, so far as the time table would allow, the students who were taking up the different branches of Engineering.

5773. Is that College affiliated with any University, or is it independent?—No. It is the Massachusetts Institute of Technology, at Boston. I know my friend, George Fitzgerald, who died lately, and who was the leading authority in Ireland on the subject of Engineering, had a very high opinion of it. We, on the other hand, have no suitable laboratories or workshops available for instruction in the higher Science in application to industry. The Trinity College Engineering School is really a Civil Engineering School. Professor Fitzgerald was very anxious to get the Board of Trinity College to spend money on providing suitable workshops for Mechanical and Electrical Engineering; but they had not money for the purpose.

5774. That remark of yours is rather in aid of the suggestion I threw out?—Yes.

5775. That the School of Science might be utilised by any teaching Colleges in Dublin?—Quite so. The number of students attending the Engineering Schools in Ireland is very small; and the reason is that the demand at the present time is not for Civil Engineering, which is taught at these schools, but for Mechanical, and Electrical, and Chemical Engineering. I believe if there was an institution here in Dublin, or Cork, or Galway, or Belfast, where suitable instruction was given in Mechanical and Electrical Engineering, these schools would be very much better attended. I sent my son to Owens College in Manchester, which is splendidly fitted out with laboratories and workshops for teaching Mechanical and Electrical Engineering. At Dalton Hall, which is in connection with Owens' College, out of forty-five pupils, thirty are taking up Engineering, and of these thirty, five Irish students joined this term. This, I think, indicates that if we had such an institution in Ireland we should have a good attendance of Engineering students. I dare say, if you made inquiries at Leeds College and Liverpool, you would find a number of Irish pupils receiving instruction.

5776. You mentioned Cork and Galway: Have you considered the question of utilising these Colleges for the purposes of technical instruction?—Yes. I prepared a memorandum, which I submitted to the Recess Committee in 1896, in which I suggested that, if Chairs in Mechanical and Electrical Engineering, and Applied Chemistry were added, it might have a beneficial effect on the trade of those cities; but I don't wish for a moment to suggest that the Cork College or the Belfast College should be changed into Technical Colleges. I think that both Cork and Belfast would rather resent that. They would be very sorry to see the professional schools taken away; and it would be a great injury to Cork and Belfast if they were taken away.

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5777. Cork and Galway, I mentioned?—Oh, of course, Galway would be different. I have formed no opinion about Galway.

5778. I don't know whether you have directed your attention particularly to scientific education in connection with Agriculture?—No.

5779. The suggestion has been made that Galway College might be retained as regards its Arts course, and developed as a school of Technical instruction with special regard to Agriculture?—I have not considered that.

5780. Professor LORRAIN SMITH.—Scientific research is another point?—With regard to that, I might mention that when Mr. Balfour was introducing the Bill creating the new Department, I pointed out that under that Bill provision was made enabling the Department to use money for agricultural research, and I suggested to him that that provision might be extended, so that the Department might be enabled to use money for industrial research. The suggestion was not adopted, and there is no provision in Ireland at present for scientific research applicable to industries. The members of this Commission are aware of the fact that in German educational institutions large sums are applied in chemical research as applied to industry. I think it might be desirable in an institution of University rank that some provision should be made for research of this kind.

5781. Is not it chiefly a voluntary matter on the part of the heads of industry in Germany?—To a certain extent it is; but at the Universities there is a very considerable amount of research done.

5782. But that is abstract?—Not altogether.

5783. Research directly bearing on industry is, in some countries, endowed from voluntary sources. It is a question if we could get Irishmen to come up to that point?—I am afraid your Irish merchant is not sufficiently educated to see the advantages of it.

5784. Don't you think that to bring in the question of endowment of this industrial research would be overburdening the matter?—Well, at present there are no laboratories available. I am only pointing out that it would be desirable. Of course, it might be overburdening the inquiry.

5785. Dr. STARKIE.—You expressed the desire that Pedagogy—the training of teachers—should be recognised in the University?—Well, it is recognised that provision should be made for the training of teachers somewhere.

5786. Yes. Don't you think that as there are Training Colleges at present in existence, in a large number, in Ireland that there might be, in connection with them, departments for the training of teachers in Secondary Schools, and the higher Primary Schools; and that the training of both might be brought in connection with the University in this way: that, as Universities should recognise the courses taken out in the College of Science, so Universities should recognise the training done in certain institutions in Ireland; and that at the end of the course they should examine, perhaps, in conjunction with the Professors of the Colleges, the students, and should give the University diploma, which is at present rather vainly offered at Trinity College and the Royal University?—I think it is quite possible some scheme of that kind might be worked out. The only difficulty I see is that at the present time Primary Education is under one Board, and Intermediate Education under another. I should be very glad to see them under one Board, as far as I am concerned.

5787. You are aware that the aim in all parts of the world at present is to unify these systems. They have come to the conclusion in England that it is difficult to draw the line between Primary and Secondary Education. As the Intermediate Board have established a harmony in the teaching of Science with the new Department, so the National Board and the Intermediate Board might agree?—If they could it would be most desirable.

5788. One advantage of that would be that the teachers in the Primary Schools would be brought in connection with the teachers in Intermediate Schools, and in the Universities?—Yes.

5789. That would be desirable, for I suppose you agree that the teachers in the Primary Schools up to the present, though they have been trained in the National Schools, and subsequently in the Training Colleges, have not received a liberal education?—They have not had a liberal education.

5790. But that without any great expenditure of money, or any great disturbance of present arrangements, it would be possible to bring the training of teachers in closer connection with the Universities, and so remove that objection to the diploma given in Pedagogy, which practically robs it of all its value, viz., its theoretical character. Have you anything else to add to your evidence?—There is only one other point. I am persuaded that every University student intended for an industrial life should receive a liberal education, including Languages, History, Literature, Pure Mathematics, and Art, and, on the other hand, that every University student, whether intended for an industrial career or not, should possess an elementary knowledge of Science, and be able to draw.

The Witness withdrew.

The Commission adjourned until the following morning.

FOURTEENTH DAY.

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SATURDAY, NOVEMBER 30TH, 1901,

AT 10.30 O'CLOCK, A.M.,

At the Royal University of Ireland, Earlsfort-terrace, Dublin.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT. D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.; and Mr. J. D. DALY, M.A., Secretary.

Colonel G. T. PLUNKETT, C.B., Director, Science and Art Institutions, Dublin, examined.

Colonel G. T Plunkett, C.B.

5791. Mr. Justice MADDEN.—Colonel Plunkett, you are a Colonel in the scientific branch of the Service—the Royal Engineers?—I was.

5792. And at present you hold the post of Director of the Dublin Museum?—The official title is "Director of the Dublin Institutions of Science and Art," though generally called, for shortness, "Director of Dublin Museum."

5793. You have devoted a great deal of attention for many years to the subject of Technical Education?—Yes, I have.

5794. You gave us valuable assistance, I recollect, when we were inquiring into the subject in connection with Intermediate Education?—I did give evidence before that Commission.

5795. You have given special attention to the provisions made on the Continent for technical instruction?—I went this year on the Continent, not for the first time, to look, in addition to other things, into the progress which had been made, especially in Germany, within very recent times, in the great Technical Colleges,—in the extension of those Colleges and of their work.

5796. You have a general acquaintance with the German system of technical teaching?—Yes, I have, especially with the Technical Colleges and the higher class of technical teaching.

5797. The Colleges—Polytechnic institutions or Colleges—are quite independent of the Universities, are they not?—They are absolutely independent and separate in Germany.

5798. In fact they might be termed "Technical Universities." They are institutions complete in themselves?—They are institutions complete in themselves, yes.

5799. And they give technical instruction of the highest kind?—Of the very highest kind—what is not usually spoken of here as technical instruction. Of course, it is a very comprehensive term. "Technical instruction" might include the education of a doctor or a lawyer. But the instruction given in these Colleges is the instruction, generally speaking, of what are known as engineers—mechanical, electrical, mining, civil,—and of chemists for all kinds of practical work, manufacturing chemists, and constructors of chemical works, and leaders of great industries of that sort; to educate them.

5800. We all know that there are two classes of schools in Germany—the *Gymnasia*, which correspond to our Grammar Schools, and the *Realschulen*, which might be described as modern schools?—Yes, there are.

5801. The students from these schools pass, as a rule, either to the Polytechnics or to the Universities?—A very large number do; that is the object.

5802. That is the idea—that they should go forward from what we call Secondary Schools, according to their ideas of life, or their destinations in life, either to the Universities or to the Polytechnic Schools?—Yes, that is the case exactly.

5803. Side by side with these Polytechnic Schools there are schools which give Technical Education of a more practical character, which might be described as a sort of apprenticeship?—Yes. In Germany there are what they call "Handicraft Schools," for educating superior artificers, foremen, designers, and so on. Youths who enter the Technical Colleges are from the same classes as those who enter the Universities, and would very seldom have been educated in public Elementary Schools; for clever boys from those there are the handicraft schools for training superior artisans.

5804. I mention that because our attention has been called to the necessity of carefully distinguishing between the kind of Technical Education which corresponds to the teaching of an apprentice by his master, and the higher Technical Education, with which alone we are concerned. That distinction is clearly maintained in Germany in the way I have indicated?—It is clearly recognised in Germany—absolutely.

5805. Is there any training in the Polytechnic Schools other than the higher Technical Education; I mean, is there any Arts course, or a course of instruction in Pure Science?—Undoubtedly, some students take up Chemistry or Physics, for instance, in one of these institutions. They are not now called Polytechnics, but *Technische Hochschulen*. Some students undoubtedly do take these sciences up, and from taste or some other reason do not go so far, perhaps, in the Applied Science, and become Professors or teachers of Pure Science. But that is not the object of the institutions; it is simply that you cannot prevent a man, when he has been educated, going to what line he likes. The object of the institutions is as you have put it—to turn out what we call, roughly speaking, leaders of industry.

5806. And to train mining and electrical engineers?—Electrical engineers—men who are fit to design and to carry out great electrical works, for carrying power, or for lighting towns, and so on—not merely men who go round with a gang and carry out the work.

5807. Is there any work in the direction of research done in these Polytechnics?—There is a great deal. At Charlottenburg, especially, there is a great deal of research done.

5808. Discoveries in Chemistry have resulted in the establishment of new industries; is that not so?—Most certainly. And not only that, but I was thinking while you were speaking of the advances which have been made in mechanical inventions, of the improvement of engines. Engines of different kinds are sent by inventors to be tried in such places as the Physical Institute, which is alongside and practically part of the Charlottenburg *Technische Hochschule*, and advances in Mechanical Science and Electrical Science are made by the researches carried on in these laboratories, as well as in Chemistry in the Chemical laboratories.

5809. Are the students trained in research, or is the work of research done by the Professors?—The students are certainly trained. I did not see all of the institutions, but there is a great deal of training given to students in these great Colleges in the methods of research.

5810. At what age, generally speaking, do students enter these schools?—Those who are going to be mechanical and electrical engineers are generally speaking, looking to employment on the State railways, which are the railways of Germany, or some other such great branch of the Government Technical Service, and these are obliged to spend a year of practical training in a workshop before they can enter on their course; therefore, they are generally nineteen or nearly so before they enter. That year in a workshop is generally made into two years, because I

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found on actual inquiry from Firms who make machine tools, Iron works, and so on, that they will not take one of these young men for less than two years. They say that one year is useless. Therefore, these youths who left school at about seventeen years of age or a little over are nineteen before they go into these Colleges. But a considerable number of others, who are not going into these mechanical lines, enter the Colleges at eighteen and seventeen years of age.

5811. How many years does the course of study cover?—Three years is the minimum for what we should call an associate course. A great many take four years. An engineer very often indeed takes a three years' course, takes out his diploma then as a mechanical engineer, and then takes another year in order that he may have two diplomas—one mechanical, and one electrical—a great part of the courses being identical for both.

5812. There are apparently diplomas in different branches?—Yes.

5813. Can you tell us what diplomas are given?—They can also give the degree of "Doctor of Science"; it is only within the last two years that that privilege has been given to these Colleges.

5814. Is it given to all of these Colleges?—To all of the *Technische Hochschulen*; they are all under the one central authority for education.

5815. That is a matter merely of detail; do not interrupt your evidence?—The information would be in many of the books and returns; I could send it

5816. The education there eventuates in a diploma, and you say that recently, within the last two years, these institutions have been enabled to confer the degree of Doctor of Science?—Yes, of Doctor of Science.

5817. That degree they confer quite independently of the University?—Quite.

5818. Most Rev. Dr. HEALY.—Do they confer the degree of Bachelor of Science?—I do not know; I believe there is no such degree in Germany.

5819. Mr. Justice MADDEN.—At all events, you know that they confer a recognised degree in Science, that of Doctor of Science?—I know that.

5820. You mentioned that these German Technical Colleges are under a central government?—Entirely.

5821. Can you tell us whether it is a Department of the State?—Yes; the Department of Education of each State in Germany.

5822. The Department of Education in Germany is charged with Primary and ordinary Secondary Education, as well as with this Technical Education?—I believe that it is charged with the Primary, and the Secondary or Intermediate, and the University Education of the country, as well as with these Technical Colleges. But I only believe that; I am not certain.

5823. It is charged with education generally?—Yes, so I believe; with all the education of the country, except that given in the handicraft schools, which are under the municipalities.

5824. I know that you have visited a number of these institutions, and I will ask you some questions about them individually. But I should like to know whether these separate Colleges—take Darmstadt, Hanover, Aix-la-Chapelle, Charlottenburg—are self-governing institutions; are they what might be called autonomous Colleges, or are they governed from a central authority? I mean in the matter of prescribing courses, and in the internal regulation of the Colleges?—I did not inquire particularly into that, but so far as I gather from talking with Rectors of one or two, and with several Professors, I think the course is very much the same in all, and that, speaking generally, though little details might be left to the Councils of the Colleges, all the general lines are laid down by the Department of Education.

5825. Passing for a moment to the Universities, they teach Science?—They teach Science. But the only University I went to this year was the University of Berlin, to see their new chemical laboratory, which is rather a famous building—I mean, it is a very fine one—and I gathered that, with a few exceptions, the Chemistry taught there is entirely for those who are going to take to medical or pharmaceutical work; it is a preparation for that.

5826. In fact, it is a preparation for one of the old professions?—For one of the old professions, though I found there was an exception myself; there was an American student there, who had been working in this country as well as in America, and he was there doing in vacation some research work with a German.

5827. I should conclude that students who intend to become mechanical or electrical engineers, or scientific chemists, do not resort to the old Universities?—No, certainly not; as a rule, they undoubtedly go to these new Technical Colleges.

5828. How are ordinary civil engineers educated in Germany—do they receive a University degree or diploma, or do they receive their education at the Technical Schools?—They receive their education from these Technical Colleges.

5829. Therefore, they have not the advantage of an Arts course in a University?—They have not; but it should be remembered that, according to the German school system, they have had a very excellent education up to the age of seventeen years, at least, before they go into the College.

5830. Before they leave the *Gymnasia* probably?—Or the *Ober Realschulen*.

5831. Is there anything in the nature of a leaving certificate given by the *Gymnasia* or *Realschulen* which carries the student up to the Technical College?—Oh, yes.

5832. That, I suppose, is a guarantee of some instruction in Arts—of a certain amount of liberal education?—It is a guarantee of a very fair liberal education.

5833. Though not exactly of the University type, but of the type of the higher Secondary School?—Yes.

5834. Dr. STARKIE.—Is it not a fact that even in the case of the Universities the leaving certificate would relieve a student from any further study in Arts?—I have heard that, but I do not know it of my own knowledge.

5835. Mr. Justice MADDEN.—That is to say, a student who takes up a scientific course in a University can specialise at once?—I believe that is the case, though I did not actually inquire into it as a matter of fact myself.

5836. You mention Berlin. You visited not only the University there, but the Technical College?—The Charlottenburg institution is the great Technical College of Berlin, though it is referred to as the Charlottenburg College, it being in that suburb.

5837. That is one of the Technical Colleges?—Yes; it is the finest of those in Germany—the largest.

5838. How many students has it?—It had about 4,800 last session, and the Rector, with whom I had a long conversation, said that he confidently expected 5,000 this October, and there were some new buildings in connection with the electrical laboratories and mechanical laboratories just then in progress, which, he said, would enable him to cater well for 5,000.

5839. Dr. STARKIE.—Are they all day students?—All day students; there is no evening work.

5840. Mr. Justice MADDEN.—No evening work?—Nothing after seven o'clock at all; nothing after six o'clock generally. I said to the Rector that I presumed when they had sufficient buildings and plant to educate 5,000 students, they would have sufficient for the needs of the country for a good many years to come, but he said, "Not at all; I confidently look forward in a few years to having to add 50 per cent. to the whole of our accommodation.

5841. When you say "the needs of the country," you mean that portion of the country, because there are several of these schools in Germany?—Quite so; it does not cater for the Rhine Provinces, Hesse, and many other parts. They not only consider they will have to increase their present Colleges, but, in addition to the number they have, they have one now in progress of building at Dantzig, and they have decided on commencing another at Breslau.

5842. The necessary funds for the establishment of these great Colleges are supplied by the State, are they not?—Partly, and partly by municipalities.

5843. Partly by municipalities and partly by the State?—And partly by the fees of students.

5844. The students' fees, of course, would be a source of income?—Yes.

5845. They are established by funds contributed partly by the State and partly by municipalities?—Yes.

5846. Probably you are not in a position to tell us in what proportions?—I do not know the amount in the case of Charlottenburg, but I did find out exactly in the case of Darmstadt, the proportions they paid towards the annual income. The State of Hesse contributes £5,000; the city of Darmstadt contributes £10,000 (I am taking one mark as equivalent to 1s.), and then the students' fees come to £15,000 per annum. So that their annual expenditure is about £30,000

5847. Dr. STARKIE.—What are the students' fees per head?—I can tell you, roughly speaking. Students who

take the courses which correspond to our Associate course in the Charlottenburg College pay from £15 to £20 per annum; in the Darmstadt College the fees appear to be lower. Fees are remitted in some cases of promising students who cannot afford to pay.

5848. Mr. Justice MADDEN.—With reference to Charlottenburg, I presume that the Technical School is supplied with adequate apparatus and laboratories?—It is very handsomely equipped indeed; it is equipped on a magnificent scale in all those respects.

5849. Were the Colleges equipped by the State, or by the State and the municipalities conjointly?—That I cannot say.

5850. The equipment is of a kind specially adapted for technical teaching, whereas I presume the equipment of the Berlin University is specially adapted for the kind of teaching which you have adverted to—University teaching?—Undoubtedly, though a chemical laboratory will be to some extent very much the same, whatever the object of the teaching is to be.

5851. But very special appliances are necessary now for the training of engineers—mechanical and electrical—over and above the chemical laboratory that you might expect to find in an ordinary University; is not that so?—Very much so, as exemplified in the case of Charlottenburg Institute.

5852. It would be very interesting if you were to give us an account of the nature of the equipment which you found there, because, I suppose, that could be taken as a thoroughly well-equipped Technical School?—It is the finest. In the Engineering Machine-room, which was 164 feet long and 33 feet wide, all new types of engines are examined and tested. There is considerable competition amongst manufacturers of engines and machines to get their inventions sent in there for some weeks or months to be thoroughly tested and indicated by the Professor and his assistants with his classes of students. So that not only do the students learn all about a new machine, but at the same time the inventor gets to know thoroughly, and brings before the public its capabilities. There are a Professor and six assistants simply for the teaching in that one room. There is, among others, a new engine, called the Sulphur-dioxide Engine, which is being tried there, and which the Professor himself, or one of his assistants, told me they thought might save 30 per cent.; increase, that is to say, the power derived from the fuel by 30 per cent, but it was still under experiment. In what is called the Engineering Institute, there are a number of testing machines, in which manufacturers, and contractors, and others can have tested steel, iron, cement, stones, building materials of all kinds. There is one machine in it which is capable of testing up to 100 tons' resistance both to tension and compression, and also of registering a metal's elasticity. There is another one for testing up to 50 tons, a third for testing flexure up to 50 tons only, and another which will test any kind of strain—tension, compression, flexure—up to 100 tons. There is one for testing blocks of iron and stone for compression and tension up to 100 tons. I took these notes as an example of the liberal way in which these institutes are supplied with machines of all kinds. That is an institute which is considered insufficient. At present it is used by the public, by which I mean contractors and engineers, who send their materials to be tested. It is also used by Professors of the College, who bring their students in to see the operations, and to assist in carrying them out, and to learn. But they are going to build a new institute entirely, to which the larger machines will be removed, and, no doubt, some new ones added for the outside public, if I may say so, while this one will remain with the smaller machines only for the student classes. There is a laboratory attached to that part, quite in addition to the chemical branches of the College, for testing the resistance of materials to fire and to acids, that is to say, cement, building stones, and bricks; there are diamond drills and saws for cutting sections of hard stones; there is a refrigerating machine for trying the strength of building stones, and other such materials, when they are reduced to very low temperature, to try the action of frost upon them. There is another room for the microscopic examination of oils, materials for making paper, and so on. This is all in one annex, if I may call it so, in addition to the chemical and other laboratories of the College. The Chemical department is a large annex. As regards the students there, speaking generally, though there is a great deal of option as to the length of the course they will take—there are many ways in which they may take it, some taking more general Science, some taking more special—but, as a rule, I found, as the result of a good deal of questioning, they take two years' general instruction in Science in the College, then one year of Pure Chemistry, then one year, and very often two years, of some special branch of Applied Chemistry. To show the size of the annex, I may say that there are over fifty lecture-rooms and laboratories in it. As an instance of the liberality with which they equip these Colleges, perhaps I may mention that the exhibits which were collected in Germany for the Paris Exhibition in the Chemical industry section, which are said to be worth £30,000, were brought back from Paris, and the whole of them handed over to the Charlottenburg Institute. Seventeen Professors and assistants in that College were sent to Paris to study the particular exhibits which bore on their teaching. In the department where Electrical Engineering, or Electro-technology, is taught, there is one very large laboratory, divided into what they call eighteen stations, with a motor and dynamo to each, at which a group of four or five students is taught, so that the men get very individual and careful instruction. There is a long gallery with three laboratories off it, in which others are taught, so that altogether 300 students are working at Electro-technology at one time. They had two accumulator batteries of sixty cells each. I thought it not worth while to inquire as to the exact number and power of the dynamos, as I could not keep the Professor too long, but I found that it took one 25 h.p. and one 100 h.p. engine to work their electrical dynamos alone. There is an Architectural Faculty, as we should call it—an Architectural division of the College. They have a large gallery and a large number of rooms, with an immense collection of architectural casts, and drawings, and diagrams, and I had a talk with the Professor in charge of that department, as well as with those in charge of the Engineering, and they seemed to think that it was very advantageous to an architect that he should learn the art of Architecture there, and at the same time he could take courses in the practical part of Building Construction. With reference to what I said as to the students for the Mechanical and the Electrical Engineering having first to take courses of one or two years—at least one year—in a workshop, the Professors said that though the rule was obligatory only upon those who were going in for Government employment—which means a very great deal in Germany, as the railways are in the hands of the State—they would like to see that rule applied to all. They thought it should be, and they hoped it would be a rule made for all who were taking Mechanical Engineering.

5853. Professor LORRAIN SMITH.—You mean in the sense of getting the degree legalised?—They would like it to be a rule that no man could have a diploma given to him in Mechanical or Electrical Engineering (which go together) unless he had spent at least one year at the bench in a workshop before going into the College. I gave a good deal of attention and inquiry to that point, because I know that their system and the American system are so very different, and the French is different again. I wanted to see what their views were, and that is what the Professors said. I think those are the principal points which occur to me.

5854. Mr. Justice MADDEN.—As you are aware, we are inquiring into Technical Education in its widest sense, but in relation to University Education?—Yes, I understand that.

5855. So far, the result of your evidence has been to place these side by side; but Technical Education is in Germany something outside the ordinary University system?—It is in Germany.

5856. Has there been a movement in Germany leading towards any co-ordination or co-operation between the Universities and the Technical Schools?—I heard of nothing of that sort whatever. I think that they feel there is ample room for both, that what you alluded to as the older professions, will keep the one full, and that the great demand there is for mechanical and electrical engineers and manufacturing chemists, and so on, will keep the others full.

5857. In the Universities is there any desire to undertake technical training, or is it considered advisable to leave it to the Technical Schools?—I am not able to answer that.

5858. You are not aware of any movement of that sort?—I am not aware of any movement of that sort, but my inquiries were entirely among those connected with Technical Colleges or with manufacturers who made use of them themselves.

5859. Passing from Germany to our own country, do you consider it desirable that our University sys-

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tem should be co-ordinated with a system of Technical Education, having regard to the peculiar circumstances of our own country?—I do not think I have sufficiently considered that question to give an answer.

5860. At present the department of which you are Director is a branch of the newly-established Department of Agriculture and Technical Education?—The institutions with which I am connected are under that Department.

5861. That Department has been officially represented here, and I do not propose to ask you—nor would it be proper to do so—any questions as to the working of that Department, or as to the future programme of that Department. But I should like to ask some questions about the Royal College of Science in Dublin. I mean merely as to matters of fact, quite apart from the existing state of things or from any programme the Department may hereafter settle. That School of Science was formerly, before the establishment of the Department of Agriculture and Technical Instruction, under what was popularly called "South Kensington"?—It was under the Department of Science and Art.

5863. And you had at that time a connection with the College of Science?—Oh, yes; I was under the Department of Science and Art for about five years.

5864. What was your position with regard to the College of Science?—The same as at present. When I first came here, that College and the Museum, taking with the Museum the School of Art, the Botanical Gardens, and the National Library, were under separate management, and I was connected with the College only. Then, on the death of Dr. Valentine Ball, they amalgamated them, and for the last part of my time under the Department of Science and Art I was in exactly the same position as I am now in under the Department of Agriculture and Technical Instruction.

5865. The Professors of the Royal College of Science were appointed by the Department of Education in England?—By the Department of Science and Art.

5866. What does that practically mean? In whom was the patronage vested?—In the Lord President of the Committee of Council on Education.

5867. He was the person responsible for the appointment of all the Professors?—No doubt, he or the Vice-President—I cannot, of course, distinguish between the two—actually made the appointments.

5868. He, as the Head of the Department, was responsible?—He was responsible.

5869. And the tenure of the Professors was, I presume, and continues to be, ordinary Civil Service tenure?—It is.

5870. The College of Science is not equipped to the same extent for teaching Practical Science at the institution at Berlin that you have mentioned. I need hardly ask you that question?—Not at all. But I should like to say, in justice to the College, that when one of the staff—rather an eminent man in Physics—of the Technical College at Munich, in Bavaria, came to Dublin, he said he was very much astonished to find that we had such a fine institution for teaching Practical Science, and that he found it in many ways a very well-equipped and very useful College, though on a very much smaller scale than anything he was used to at home. He spoke of it very highly indeed, and I saw it afterwards mentioned in his report. He had been inquiring as to the higher technical instruction in Great Britain as well as in Ireland.

5971. That College, though up to the present not equipped upon the same scale as one of the great German Technical Schools, is somewhat analogous to them in its functions?—Oh, it is, no doubt, but it has been very weak in such things as its Mechanical Engineering from having none of those great laboratories and appliances which they have.

5872. Is there any place in Dublin where Mechanical and Electrical Engineering can be studied with facilities at all approaching to those in one of the great German Technical Colleges?—None at all; this College comes nearer to them than anything else.

5873. That is what I wanted to bring out?—Oh certainly.

5874. This College is fashioned after the model of those German Technical Schools, but it lacks the apparatus and appliances which have been provided there?—Yes; that is the case.

5875. But supposing it were possible to provide the College of Science in Dublin with the necessary apparatus for teaching Mechanical and Electrical Engineering, for pursuing research into Chemical investigations, and matters of that kind, it might well supply for Dublin, at all events, and possibly for a larger area, the place of one of those great institutions?—That is what we hope it will do, and I think I may say that it is fully the wish of the Department under which I am serving that it shall be so extended and equipped as to be able to do that.

5876. You say you have not directed your attention specially to the problem of incorporating higher Technical Education with our University system, but supposing it were considered desirable that this should be done in the future, the thought suggests itself, and has suggested itself to witnesses who have been examined here, that such an institution properly equipped, while it stood apart from the Universities or teaching Colleges in Dublin, might be utilised by all of them, in so far as their curriculum embraced a course of technical instruction. Does that commend itself to you?—As a matter of fact, we have during the last seven years frequently had students from other institutions. We have had one or two who have been taking courses in Trinity College, and, at the same time, taking a course in our College, and we have certainly had many students of the Catholic University College who have taken a course in this College.

5877. Therefore, that idea is not mere theory, but it is in practical existence?—I have not the least information as to the future intentions of the Department with regard to the College, but the doors have been open to students wherever they might come from, and wherever they might be employing the rest of their time.

5878. I suppose you would recognise that in dealing with the question of scientific education, we ought not to limit our researches to any particular grade of education; but that the question of the scientific education of a people must be considered in view of the entire educational system leading up to University Education?—Certainly. These Technical Colleges of Germany could not have been so great a success as they are unless there had been those *Realschulen* and *Ober Realschulen* in Germany to prepare students for them. Nor would the great Technical College of Zurich in Switzerland have been the great success it is unless there had been in Switzerland such an Intermediate Education as would fit students to enter the College. I might say that a great many of the students at Zurich come from Germany.

5879. Might that observation be applied still further: might not the general scientific education of a people depend also to a certain extent upon Primary Education?—Very much so.*

5880. That is to say, the early training of hand and eye accorded in the Primary Schools?—That is my idea. Unless the foundation is properly laid in the Primary Schools there will be very great difficulties in the intermediate, and, necessarily, in the higher grades.

5881. Has attention in Germany been called to that circumstance; are you aware whether the Primary Schools lead up to or are intended to lead up in any way to the Secondary Schools, or are they provided for a different class of students altogether. Perhaps you have not considered that question?—No; I think it would be rash of me to give an opinion. I think they are decidedly co-ordinated, all of them, together, but I would rather not generalise without inquiring very carefully into it.

5882. Quite so. There is another connection of a different kind between the instruction in these different classes of schools and the Universities; that is to say, the Universities or the higher schools may be looked to as supplying teachers in the Elementary and in the Secondary Schools. But there is also another connection, is there not: may not promising students who may hereafter become leaders of industry in the country be brought up from one grade to another by means of Exhibitions and Bursaries?—Yes, that is certainly the case.

5883. Is that a question which you have considered?—That is undoubtedly the case, but it did not seem to me that there was any great desire for that or faith in that in Germany. That is not a leading characteristic at all of their education. Their idea is to educate in the general Primary Schools of the country and then in their evening classes, corresponding to English Continuation Schools, and to get into the handicraft schools to educate in a very practical and very useful manner the general artisan population of the country, but not to try to get them on from stage to stage to the University. It appears to me that that is opposed to the genius of the present system in Germany.

5884. You visited not only Charlottenburg College, but the College at Darmstadt. Charlottenburg may be

* NOTE—It must be remembered that boys enter the Realschulen in Germany at about 7 years old, so that in these schools both the Primary and Secondary Education (as we call them) are given.—G. T. P.

taken as one of the highest type, as you said, but tell us something about Darmstadt?—Darmstadt, as I have mentioned, has an expenditure of £30,000 a year, which I have no doubt must represent a much larger amount than if it was expended in Great Britain or Ireland, because all their rates of payment are so very much lower. It is a very complete and very excellent College.

5885. How many students has it?—1,600 I think you said?—It has 1,600 students and 100 Professors and assistants, but it must be remembered that many of the teaching staff in Germany teach in several schools; they specialise much more than we do. A lecturer takes some one branch of a subject, and he lectures on that branch perhaps in two or three schools, besides in the Technical College. But there are 100 who are employed there who do lecture and teach at different times.

5886. You were about to tell us of the provision made at Darmstadt?—They have a main building and some annexes. The annex which is for Physics and electrical work only cost very nearly £18,000. Then I cannot say what was spent on it for the Physics and general apparatus. I could not find out. But for the electrical part of that only they spent £5,657 on fittings and apparatus. Then they have an electrical installation for supplying current to the College buildings, for lighting, and also for the chemical work—electro-chemistry—and they spent £5,500 on that central electric installation.

5887. And I presume the equipment for every department of the scientific teaching is on the same scale?—On the same scale—Mechanical Engineering and everything else. And that may be taken as a type of what they provide for a small population, that is to say, for the State of Hesse and the town of Frankfort, which is evidently catered for.

5888. What is the population?—About 2,280,000.

5889. Is there any other special circumstance connected with Darmstadt to which you would wish to call our attention? Is the number of students in that College increasing?—Yes, it was increasing there, and, in fact, in every one they told me the number of students is increasing. In the Mechanical Engineer's laboratory at Darmstadt there are at present six testing machines of different kinds, but this is considered to be insufficient, and a new building with more extensive plant has been asked for.

5890. Are there any special features connected with the institutions at either Hanover or Aix-la-Chapelle to which you wish to call our attention, or may we take the institutions which you have described as types?—I think it is sufficient to take them as types, as they are all very much alike. They are alike in the courses of study, and they are alike in their equipment; the difference is rather one of size than anything else.

5891. Besides these Colleges, are there not in Germany schools of Decorative Art?—Oh, yes, there are.

5892. Are they independent institutions, or are they connected either with these Technical Colleges or with the Universities?—They are quite independent; they are under the Department of Education, and they are not connected either with the Technical Schools or with the Universities.

5893. Do they give diplomas or certificates, or what is the evidence of having passed through the course?—I am not certain whether they give diplomas or leaving certificates, but they give some such document.

5894. There is. I believe, in Berlin, an institution for training scientific agriculturists?—Yes, there is, a very fine one.

5895. That is a question, I need hardly say, which touches us very closely in Ireland; I mean the question of the application of Practical Science to Agriculture. It would be interesting to know what has been done in Germany?—They have a very fine institution there, with a small botanical garden and geological, zoological, and other museums attached to it. The students go there for a very complete course—a certain amount of Mechanics and Surveying, Zoology, Botany, Veterinary Science, and what is generally classed under Agriculture.

5896. The laboratory of an institution of that kind, I presume, would be really a farm—or, at least, that would be an important part of the laboratory. Have they anything of that kind, do you know, attached to that institution?—No, apparently not—only the botanical garden.

5897. Has it been long in existence?—A great many years, I believe; it is an old institution.

5898. Are there many students?—A great many students.

5899. About how many?—I am not sure that I took a note of that; I have not it with me if I did. If I find it I will write in the number.*

5900. With what view are those students trained? What is their ultimate destination, as a rule?—I inquired very carefully as to that, and I found that a great majority are large farmers or proprietors of land, men who may be said to be very well off, and they go back again with their knowlege and remain large agriculturists, farming on an extensive scale. That was the majority, but there are also a good many who intend to be teachers and lecturers on Agriculture.

5901. Over how many years does the course of training extend?—I am sorry I have not made a note of that College, but I think it is three years; it may be four.

5902. Three or four years?—Yes, I am not sure; but I will correct it if I am wrong.

5903. At what age do the students go there; do they proceed to that special school from the Secondary Schools or from the Universities as a rule?—They go at about eighteen years of age.

5904. From the Secondary Schools?—From the Schools—the *Realschulen*, or other schools to which men who are well off send their sons; they have not for these classes "Primary Schools" and "Secondary Schools."

5905. Are there corresponding institutions in the other German towns, so far as your knowledge goes?—I cannot say without looking, I do not know; I did not inquire.

5906. You paid that recent visit to Germany for the special purpose of inquiring into these institutions?—I went with the object of looking at the organisation and arrangement of certain museums in Germany, and also for looking at the Technical Schools at Charlottenburg and one or two other places. That was the object of my visit.

5907. But your attention was not specially called to the institutions for training scientific agriculturists?—No, it was not, but being in Berlin and that institute being there I spent a few hours there in inquiring about it.

5908. In studying the subject you have made yourself acquainted with the technical institutions of America, though, I believe, you have not actually visited them?—I have never been in America, and I may say that most of my knowledge is derived from that excellent report of Mr. Reynolds, who I believe, has been before this Commission.

5909. He has. I will not take you in detail through these matters, but I believe there are a good many institutions in America that do similar work to that of the German Technical Colleges?—Very similar work. The great difference is that in these American Colleges as a rule a considerable amount of the students' time is given to actual workshop work—working at a bench. In Germany they do not believe in it. I talked a great deal with the Professors about it. Probably there are some advantages and some disadvantages in both systems.

5910. Do you know whether they are co-ordinated with the Universities or recognised as affording part of the training for scientific degrees in the American Universities?—In America I know that several of them are actually parts of Universities.

5912. The Most Rev. Dr. HEALY.—There are only one or two questions I wish to ask. You visited Belgium also, I perceive?—I did visit Belgium for a short time on my way.

5913. You say that one of the Universities is practically a Technical College; to which of them do you refer, may I ask?—Liege.

5914. That is on account of it being a great manufacturing centre, I suppose?—I have no doubt it is on that account, there being the mines and manufactures around. It is, intentionally or unintentionally, developed chiefly on the lines of Mechanical, Electrical, and Mining Engineering, and the fact is that, though one may say in Belgium, "We have no Technical Colleges—*Technische Hochschulen*—as in Germany," as a matter of fact, that University, I was assured by an official in the Department, is chiefly given up to that.

5915. Were you at Louvain at all?—I was not there.

5916. I asked you that question because we heard from another witness here that there was an agricultural department in that University, and I was anxious to know something about it?—I know there is one in it, but I know nothing about it.

* There are about 300 Students of Agriculture in various Colleges in Germany, as follow:—(i.) In Universities where there are Chairs of Agriculture (Breslau, Giesen, Göttingen, Halle, Kiel, Königsberg, Leipsig, Rostock). (ii.) In Agricultural Colleges having a certain relation to Universities (Jena, Bonn-Poppolsdorf, Berlin). (iii.) In the Technical College of Munich where there is a Faculty of Agriculture. (iv.) In Agricultural Colleges unconnected with other institutions (Hohenheim in Würtemberg and Weihenstephan in Bavaria).

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5917. And a successful one too?—I believe it is successful, but I know nothing about it.

5918. Do you know whether there are in Germany any Agricultural Colleges or institutions to which they have a large farm annexed for the purposes of practical education?—I made no inquiries upon that topic whatever.

5919. Because the Germans are so practical a people that I would expect them to have some institutions of that kind for practical work. But you said a moment ago that they did not believe so much in the Technical Education at the workshops as the Americans do; perhaps, they do not believe either in a farm for agricultural purposes?—You must remember, my lord, that for certain lines they insist that students shall have spent one year or more in a workshop.

5920. Professor LORRAIN SMITH.—Continuing this question of workshop work, in the trade schools do they not teach skilled trades?—Undoubtedly, in the trade schools, the handicraft schools.

5921. It is chiefly or altogether that?—There you find them working at the actual making of ornamental wrought-iron work or at other handicrafts.

5922. That depends, therefore, on the distinction between the scientific teaching of technical work and the practical teaching—the teaching of the masters and the teaching of the workmen?—Quite so; they do not mix them up; they keep them entirely distinct; though I need hardly say that in the handicraft school for the workmen, which is an evening school, they teach a certain amount of Geometry, and of Drawing, and of Arithmetic, and Mensuration—such things as are necessary to improve a workman or a foreman in his trade. That has nothing to do with the higher Technical Education for masters.

5923. Has any objection been made to that teaching, as to the utility of that form of teaching—of teaching workmen Science, Geometry, and so on?—I never heard of any objection to it, and from the long talks I had with some of those who were engaged in that line, they seemed to think that the schools were an undoubted success. They assured me that the men who went through the evening school in Drawing, and at the same then took some handicraft, could always command good places or take much higher places under the firms they were working for afterwards than they could before.

5924. As far as I can recollect, I have seen that system criticised really as an attempt to do workshop work in a theoretical or educational institution?—These educational institutions are open in order to teach these different branches of work which an apprentice would very likely not be able to learn in the workshop. For instance, an apprentice in a smith's workshop would usually be a hammer-man, whereas by working at this ornamental smith's work in the evening, as I saw for myself, he actually learns how to make very good ornamental iron work, and then, after a year or two of that, instead of being merely an apprentice or hammer-man in the shop, he would take a better position as an artisan.

5925. The criticism was rather directed to the point of why should you teach a hammer-man to do ornamental iron-work—he was meant to be a hammer-man?—I believe they begin as hammer-men and become smiths, and in this way they develop them into very much better smiths. Undoubtedly that would be the case with a joiner or cabinet-maker. A boy in a workshop, as we know, is for a very long time employed there during his apprenticeship at the very simplest work, and, therefore, may at the end of his apprenticeship be an indifferent joiner or cabinet-maker, having been helping a man who was doing only one line of work, whereas if he attends an evening school, and at the end of his time turns out well-finished cabinet-work in every respect, he can at once take a much higher place in the workship, and, therefore, of that art and that industry the trade is improved, not only the individual.

5926. The concrete case that I have in my mind, of which I have read somewhere, was a criticism by an educational authority, and the contention was that a workman working at a chemical factory had to do a certain routine in chemical operations, and it was no advantage to the factory or even to the workman himself that he should have any elaborate knowledge of Chemistry; it would probably damage him in his work rather than help him?—I read that also.

5927. It was that I wanted your opinion upon—as to the value of that criticism?—I think that hardly affects this question of the handicraft schools, in which the men are taught cabinet-making, embossing silver, engraving silver, working in wrought iron, working in copper, and so on.

5928. It depends really on the trade?—It depends really on the trade, but if it is a large manufacture, where the work is turning out chemical manures or turning out biscuits, it is probably enough that some man should learn to open the oven door and throw in coals.

5929. I only wanted to develop that line of criticism to see if it was of value?—I did not visit only one handicraft school in Berlin; I went to one in Brussels, and I went to one very much of the same style in Nürenberg.

5930. Coming to the higher teaching in Technical Colleges, you say that recently some of these Colleges have been given the power of granting the degree of Doctor of Science?—Yes, they have.

5931. That is by a decree of the Emperor?—Of the Emperor, yes.

5932. How many Colleges have got that power, do you know—roughly speaking, I mean?—I believe all the Technical Colleges, which would be about seven, but I know it as a fact for those in Prussia.

5933. It does not matter about the details. Practically all the Colleges of high standing?—All the Technical Colleges in Germany.

5934. Is not that really making them Universities?—It depends upon the meaning you would attach to the word "University."

5935. I mean, the granting of a University degree seems to me to be the very essence of a University; it implies teaching of the standard or level of a University, if I may say so—which is essentially what a University is?—I think that is a matter of opinion in regard to which perhaps my opinion is of much less value than that of many other persons.

5936. I mean they have to take the educational responsibility of an institution which grants degrees in the way in which the Universities grant degrees in that subject?—That is so, but the degree, again, is only a question of name. I may consider that a diploma in Engineering or in Manufactures, or in Physics, or in Natural Science of the present College of Science, Stephen's Green, is, probably, in many lines of life, quite as valuable as a degree in Science. Before the public it may make a difference whether a man puts after his name two or three of the first letters of the Alphabet, or two or three letters from another part of the Alphabet, but, practically, it is the same thing. It is a question merely of name.

5937. Let me put it in this way. Would it not be regarded in Germany as a sort of evolution of these Colleges to a higher stage when the Emperor granted this privilege?—I do not know how they regarded it at all. I should regard it as a recognition of their great importance.

5938. Then another point.—You spoke of the research work which is done at Charlottenburg Technical College. Is there any special provision for that?—Yes, in all the Colleges.

5939. Would you mind amplifying your statement on that point?—In all the Colleges there are not only the necessary laboratories for teaching elementary students and advanced students Inorganic Chemistry, Organic Chemistry, and so on, but there are a large number of special laboratories in which Professors, assistants, and students who have already done three, four, or five years' work in the College are working at research work. And a great deal of research work is done in the mechanical engineering laboratories, as I mentioned an instance—the examining into and indicating the new sulphur-dioxide engine.

5940. To go a little further: Is there any special provision in the way of leaving the staff leisure to carry out research work?—There is. Owing to their system of having highly-specialised work, and having a great many Professors and assistants to lecture on different branches of the subject, they have a great deal of leisure for research work.

5941. They accomplish this end by having a sufficiently large staff?—I do not know what the object of having a large staff is; that is a matter of national feeling and the lines on which the education is developed. But that is undoubtedly the result—the result of having this large staff is that the Professors and assistants have a great deal of time for research work.

5942. I am pursuing the question for this reason: various witnesses, both from Ireland and from England, have put before us the essential necessity of arranging the research work should be carried on in Technical Colleges and in the Royal College of Science, for

example, to carry out the purpose which has been set before them?—I entirely agree myself; I think it is a very important part of the work of a Technical College.

5943. I want evidence as to the provision which is made for that in successful Colleges, in addition to the provision for merely teaching students, and any information that you can give us would, I think, be most valuable?—I can only say that I found it to be the case in these great Colleges in Germany, that to a slight extent it is done in some lines in our present College of Science, and that I think it is a very essential part of every College.

5944. And it should be provided for?—It should be provided for, undoubtedly, as regards buildings, equipment, and staff.

5945. One witness suggested, when I was asking the question, that each member of the staff should teach five hours a day, and yet there was to be a sort of background of research?—That depends upon what you mean by the staff.

5946. Each member of the staff?—No Professor in the world could lecture for five hours a day, even indifferently.

5947. Dr. STARKIE.—They have to do so in the Queen's Colleges?—I say that when I was a great many years younger than I am now, and could do much more in a day, speaking from experience, three hours a day is as much as any man could lecture properly and well, and he would not do himself justice with more.

5948. Professor LORRAIN SMITH.—And if they do lecture three hours a day you could not expect much original research?—I should say that five hours is a great deal too much.

5949. Most Rev. Dr. HEALY.—I know a good many Professors who think two hours a day on four days a week is very hard work?—You cannot lay down a hard and fast rule, but I think to give a man five hours a day each day in the week to lecture is perfectly absurd.

5950. Mr. Justice MADDEN.—But something would also depend on the class of lectures. If they were elementary and did not require much preparation they might leave some time for research, but if they were of a more advanced character it would be different?—That is so. But very often to lecture on a scientific subject to a class of new minds, who come absolutely fresh and receptive, to teach them the very elementary parts of Science, such as Physics, Chemistry, or any branch of Physics, would be very exhausting to the Professor or lecturer, and I do not think it would be fair to expect him to go on hour after hour as if he were merely teaching arithmetic to little boys.

5951. I did not so much refer to the demand upon the Professor's time as to the amount of research that would be required in order to supply new material for the lectures; I was contrasting elementary teaching with more advanced teaching?—Just so.

5952. Professor LORRAIN SMITH.—You spoke of students from Trinity College going to the Royal College of Science?—We do not note in the register of the College anything to show where the student comes from; we merely put down his name, address, and age, but I know that during the last two sessions three Trinity College students have attended the College of Science for courses in Practical Science.

5953. A further point, in addition to what his lordship asked you on this subject, was this: were those students qualifying for a degree?—I cannot at all remember which courses they took.

5954. Mr. Justice MADDEN.—Up to the present time has the course of study in this College been at all recognised by Trinity College for the purposes of a degree?—No, certainly not.

5955. Professor LORRAIN SMITH.—You spoke of the Engineering students in Charlottenburg Institute preparing for employment on the railways?—Yes.

5956. The railways are Government institutions, of course?—Yes, most are.

5957. Has that anything to do with the success of the Technical Colleges in Germany—the fact that there is such a demand for Government employes on these, what I may call, engineering works?—I cannot in the least say whether there would be more or less engineers employed on the railways of Germany if they were under private companies than there are under Government control.

5958. It is not that that I mean. Are there any regulations by which it is made either necessary or desirable that a man who is intending to work as a railway engineer, should go through one of these Colleges?—I cannot say with regard to that specific case, but I know that in Germany the regulations as to entering all professions are very strict, that a proper education is required beforehand.

5959. Could you give us any further information on that point?—No, I cannot.

5960. Because there have been given before us, with regard to apprenticeship, the advantages which an apprentice might get if he held a given diploma in his subject, and it seemed to me, from what you said, that possibly this rule with regard to Government engineers applied?—I do not think the fact of its being Government or non-Government employment has much to do with it.

5961. Dr. STARKIE.—Would it not be a fact that as the College at Charlottenburg, we will say, is a Government College, under a Government Department, and as the railways also belong to the Government, it is exceedingly probable that the Government, in order to encourage the College, should give advantages to those who had been trained there?—I do not see any reason for believing that myself, because the Universities are under Government, and all education is under Government in Germany, and under one system. Therefore, I do not see that it affects the question. A man who wishes to be a railway engineer, or an electrical engineer, or a manufacturing chemist, or a doctor, or a lawyer, goes to the institution which prepares men for that particular profession, whether under Government or not.

5962. It has been represented by many witnesses that the difficulty in England in inducing men to go to Technical Colleges and Commercial classes is the fact that the leaders of industry and commerce give no advantage, or practically no advantage, to those who have been specially trained?—I believe that that is, to a very great extent, the case in England.

5963. But it seems very unlikely that a paternal Government, such as that of Germany, would permit that to exist in Germany, but that they, knowing the value of technical instruction, and of instruction in commerce, would almost certainly have regulations insisting upon a proper training as a condition of being employed in the Government service?—They certainly do insist that everybody coming into the Government service shall have received proper training in certain Colleges.

5964. Professor LORRAIN SMITH.—That is just the point?—But I have no doubt that they also insist that everybody going into professions outside the Government service shall have had a proper education.

5965. It is a question as to how far the response to the movement for Technical Education was a voluntary one on the part of the heads of industry, or how far it was at the suggestion, or, perhaps, even more than the suggestion, of a paternal Government?—It is a great deal owing to the military service in Germany. In order to have one year of military service in comparative comfort as a volunteer, to live at home, and to sleep at home, instead of doing three years—now two years—in barracks, a young man must have obtained a certain qualification with regard to education, and that has been an immense inducement to study.

5966. That is a very far-reaching ordinance?—That has been most effective in Germany.

5967. That would contribute to the wonderful success of these institutions?—Undoubtedly it has, very much indeed.

5968. Dr. STARKIE.—You have stated that up to the present there has been no movement in Germany in favour of connecting the Technical Colleges with the Universities?—I said that I had not heard of any whatever, but I did not inquire into it.

5969. The reason would seem to be, would it not, that in Germany lads, in order to qualify for entrance to the Technical Colleges, and also to the Universities, have to present leaving certificates?—I know nothing more than any other individual as to that point; it is not one into which I have inquired. But, of course, I could form my own opinion, and that appears to afford naturally a reason for it.

5970. But the effect of that would be that those entering the University could specialise at once, and those entering the Technical College could specialise at once and, consequently, where would the advantage be of insisting upon a University Education being given to those entering a Technical College, because, in both cases, they could specialise at once, no Arts education being required?—That is so.

5971. It has been represented to us by many Irish witnesses that there would be very great advantage in Ireland at present in connecting such a College as the College of Science with the University, in order that those taking up technical professions may acquire a more liberal culture, and, in connection with that, it

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has been proposed that a year of Arts study should be imposed upon those who wished to qualify for a University degree?—I only speak as an individual, but it appears to me that the proper plan on that point is undoubtedly the German one, that a boy should get his general education before he goes to a Technical College.

5972. The only difficulty at present in Ireland would be the comparative inefficiency, we will say, of the Secondary Schools?—That is a very great difficulty, certainly.

5973. And at present, until the standard of general education in the Secondary Schools has been raised, it might be practically necessary for the University to insist, even in the case of those entering a technical profession, on a certain Arts training?—I do not know whether my opinion is of any value upon that.

5974. We had a witness before us yesterday who had had some experience, not only of the Technical Colleges in Germany and the Technical Schools in Germany, but also of those in Australia, and he represented to us that, in his opinion, the Australian schools were superior to those in Germany in this respect, that in Australia they aim at giving Technical Education, not only to the leaders of industry, but also to the ordinary artisans, while in Germany, according to this gentleman, their only aim is to educate those who are to be leaders of industry. Do you think there is anything in that?—Not much. I think it depends upon what you call Technical Education too. Certainly Germany is not ahead of Great Britain in technical instruction for the workman in the way that she is in regard to technical instruction for the masters—not at all.

5975. I have read a great deal in many articles recently written by Englishmen, advocating the German system; they represented that a very great deal of the instruction in England was wasted upon ordinary artisans, on the rank and file?—I am quite aware of what you say.

5976. And that there was not a sufficient amount of selection. What would your opinion be upon that?—I agree in that in a great measure. I would not myself be a blind follower of the German, or the American, or any other system, but I think we should pick out the best.

5977. Pick out the best men?—Pick out the system best suited—form the best system we could for ourselves by picking out the best points of their systems. I quite agree that there has been in Great Britain—perhaps not nearly so much now as a few years ago—too much dispersion of education, and too little concentration of it on those who were to be the masters and leaders.

5978. I am glad to have your opinion on that subject, because I quite agree with it, if I may say so. I have only one other small question. Who is it that appoints the Professors in the Technical Colleges in Germany? They are under a department of the State, I know?—I cannot say; I have no doubt myself it is the Minister of Public Instruction.

5979. Mr. Justice MADDEN.—There is one further point I wish to ask you, Colonel Plunkett. You are aware, I dare say, that attention has been called lately to a branch of Technical Education—using the expression in its widest sense—higher Commercial Education of a University type. Has anything been done in Germany in that direction to your knowledge?—Yes. I did not spend any time inquiring into it, but I did hear a little in regard to it in conversation with men with whom I came in contact in Germany.

5980. What you have learnt might be useful in the way of putting us on the line of further inquiry. Will you kindly tell us what you did learn in Germany on that subject?—They are expending a certain amount of money and taking a great deal of trouble in order to educate men who are to be merchants and take part in commerce, especially after leaving school, in commercial subjects.

5981. Do you know whether that education is carried on in the Universities, or in the Technical Schools, or in independent institutions?—It is not in the Technical Colleges.

5982. Not in the Technical Colleges?—No; I think it is in one or two special schools.

The Witness withdrew.

John Alexander M'Clelland, Esq., M.A.

JOHN ALEXANDER M'CLELLAND, Esq., M.A., Fellow of the Royal University of Ireland, examined.

5983. Mr. Justice MADDEN.—You hold the degree of M.A. of the Royal University, Professor M'Clelland?—Yes.

5984. You are a Fellow of the Royal University?—Yes, a Fellow of the University.

5985. You obtained that position by competitive examination, I believe?—I attained the position of Junior Fellow by competitive examination, and I have since been elected a Senior Fellow.

5986. You obtained the position of Junior Fellow by competitive examination?—Yes.

5987. And since then you have become a Senior Fellow, as it is called, in the Royal University?—Yes.

5988. You hold a degree of Bachelor of Arts in research work in Cambridge?—Yes.

5989. Perhaps, you would explain the nature of the degree? Is it obtained by examination, or how?—The Senate simply grant permission to graduates of other Universities, whose standing is satisfactory, to come up for work in the laboratories in Cambridge, and submit their research work to the Board of Examiners. If that work is considered of sufficient merit they grant a degree for it without any other examination.

5990. What branches of research did you pursue?—I worked in the physical laboratory under Professor Thomson, chiefly in electrical subjects.

5991. You now hold the position of Professor of Natural Philosophy in University College, Dublin?—Yes.

5992. Would you, in your own language, bring before us the views which you desire to express with regard to Technical and Scientific Education in Ireland, bearing in mind that we are directly and immediately concerned with University Education, but that we have regard to the entire scientific education of the people as a co-ordinated whole?—The points I wish to deal with are research work in Science in the University and Technical Education. There should be, I think, a close connection between the two, as technical work should be concerned with the applications of scientific discoveries, for which discoveries we must, as a rule, look to the Universities. It seems to me, therefore, that if we wish to have a good technical system we must first make the University thoroughly efficient as a school of research in Science. If you begin at the other end and attempt to set up a technical system over the country without first making our Universities thoroughly efficient as research schools, I do not see how we can hope for much success. Of course, without troubling about the University we may establish a system of technical instruction, which will be productive of many good results. It will practise people in using their hands, and serve them as a good apprenticeship to a number of trades; but that class of work, while very useful, is at the same time not a very high type of technical work. We should rather aim at establishing a class of Technical Schools in which the very best men will always be at work, endeavouring to make new applications of scientific discoveries to our manufactures and industries. Of course, the other class of work would not be neglected—the practical training. I claim, therefore, that the University is the most important part of the whole system of Technical Education, and should be first taken in hand and rendered thoroughly efficient as regards research work in Science. I do not mean by this that the research work of the University should necessarily be directed towards technical subjects; the purely scientific work must be done first, and when good work in Pure Science is done for its own sake, we may be certain that it will always have useful applications. The University should do the purely scientific work for its own sake, and the Technical Schools should always be looking out for possible applications. To make the University efficient in this sense, to make it a school of research, we require, I think, a great many changes in our present system, and I might suggest the following changes which appear to me to be necessary. First, I will deal with changes in the work done by the students, and, after that, I hope to refer to changes affecting more the Professors. I think a student who is going to the Science side should be taken up as soon as he enters the University, and he should be made to devote most of his time to the particular branches of Science he selects. He may afterwards be asked to pass a qualifying examination in some other subjects, but the greater part of his time should be given to the one subject. Do not keep the Honours student at his text books too long; let him take up research work as

soon as possible. He will learn more Science when struggling with the difficulties of a piece of research work for one year than he would learn from the best text books in half a dozen years. Two, or at the most three, years at lectures and text books should qualify the Honours student to begin research. You might examine him at the end of two or three years for his Bachelor degree, but the M.A. degree or some other Science degree, to take its place, might be given only after two years at research work, and the important part of the examination for this degree should be the thesis he submits based on his two years of research work. Then the University should be in a position to offer liberal rewards for research work, so as to encourage the best students to keep at it after obtaining the higher degree. Research Fellowships might, I think, be established, with some teaching duties attached to them, but leaving the student spare time for research work. This would strengthen the teaching staff very much, and it would be a great improvement on the present system where one Professor in each subject has to do all the teaching for a multitude of examinations, leaving him no time for research work. I think if you get the proper spirit of research developed in the University, the Technical Schools are pretty certain to be successful, because you will have a supply of good men to manage them, men who would put the proper value on the simplest form of practical work, and capable, at the same time, of advancing our manufactures by new applications of Science. Perhaps when you get this atmosphere of research established, you may even succeed in convincing the heads of our manufacturing concerns that Science is of some service to them, and induce them to believe that a good salary paid to a scientific expert in their particular branch of work is not a waste of money. Of course, I realise that before it would be possible to allow the student to specialise as soon as he enters the University, we must get a different class of work done in our Secondary Schools, but with the more enlightened courses now specified by the Intermediate Board it should very soon be possible. But to render the University thoroughly efficient as regards research, we must take care that the equipment is amply sufficient, and not only the equipment, but the staff must be sufficiently large. If you simply appoint a Professor in every subject in your teaching Colleges, and leave him to do all the work for all the examinations, it is absolutely impossible for him to do any research work. Perhaps it is a fact that even people very well up in educational matters hardly realise what is necessary if research work is to be done. Most people think that, even with lectures for three or four hours in the day, there would still be a lot of time left for research work. But that I look upon as absolutely impossible. Men in Cambridge give about three lectures in a week, and even they have an assistant to get up the experiments for them, so that the lecture occupies an hour or not much over an hour. But in the Irish Colleges we have not even that. We have to deliver ten or twelve or more lectures in a week, and, at the same time, we have practically to set up all the experiments for them, which pretty well occupies all the afternoon, while the morning is occupied in delivering the lectures. That renders research absolutely impossible, for not only is the Professor unable to do any research work, but he has no time to encourage students to take it up. Another error that very soon comes in is this—that you naturally make your lectures more and more theoretical, which gets over the trouble of arranging experiments. The lectures become too theoretical and not sufficiently practical; so that the first thing you must do is to get, of course, the very best equipment, and also larger staffs. That, I think, is what must be attended to in the first place. Then there are other suggestions I wish to throw out as to changes which might be made in the work done by the students. I think we might require something there, too, something in the line I have indicated, so as to get the Honours student to engage in research as soon as you think he is qualified for it. As regards the subjects which should be taught in the University, and those which should be strictly confined to Technical Schools, I think the University should be equipped and manned so as to teach all branches of Pure Science, and also those parts of Applied Science in which much advanced theory is involved. Take such a subject as Electrical Engineering. If you leave a subject like that entirely to Technical Schools you run the risk of your electrical engineers working by certain rules they have learnt, without the principles underlying them being fully grasped. If you teach such subjects in the University you would ensure that the students first learnt the advanced theory of electricity, and then its application to Electrical Engineering. This would mean that a Lectureship in Electrical Engineering would be necessary in the University. Other similar Lectureships would be necessary in such a subject as Chemistry. Certain branches of that would have certain Lectureships established to teach them. Again, by teaching such a subject as Electrical Engineering in the University you have the further advantage that the subject is kept under the notice of those people who are giving their time to research work, and keeps the research work of the University from running too much on purely scientific lines, and keeping away from technical subjects. I do not say that in the research work of the University any effort should be made to make it technical, but still, if you have a subject like Electrical Engineering kept under the notice of people doing research work, sometimes the research work would deal with it, which would be an advantage. But I would make no effort to cause the University to direct its research work on purely technical lines. The first duty of the University is to research in Pure Science; applications are sure to follow. On the other hand, technical subjects which involve little advanced theory, but much practical skill, should be confined to the Technical Schools, and the University should not be burdened with them. That short statement, I think, contains most of the views I wish to express.

5993. You made one remark to which I would like to recall your attention. You indicated that with a better and more perfect system of Secondary Education in Ireland, it might be possible in the case of students who intended to become electrical engineers or practical chemists, to dispense with an Arts training in the University. Is that what you were pointing at?—I was looking more simply at the students who, in the University, are going to devote themselves to Science.

5994. In Germany the Technical Schools require that students should bring up leaving certificates from the Secondary School. Was something of that kind present to your mind?—What was more present to my mind was that I felt that the work we have in Science for the first year or two might really be done in schools, without paying any heed to what the students are going to do afterwards. I feel that the student should have done this work before he comes to the University, and that we should not have to occupy the first year—or more than the first year—in getting him to understand the principles of Science.

5995. In other words, that the whole scientific education of the country should be co-ordinated?—Yes.

5996. And the student brought up to the University level in Science by the Secondary School?—I would not claim that he should have learnt very much Science at the Secondary School—I do not think it necessary that he should—but he should have got familiar with scientific methods, so that he would not look upon scientific subjects as something very difficult, as he very often does when he comes up to the University.

5997. You have stated very clearly what, in your opinion, are the branches of scientific teaching that more properly belong to a University, as distinguished from a Technical School?—Yes.

5998. But as a preparation for such a profession as that of electrical engineer, a certain amount of instruction of a purely technical character would be required?—But I think a student would get that better after he had first got a thorough ground work of the principles of the Pure Science.

5999. Quite so. That is leading up to the next question, which I was going to ask you. For the purposes of acquiring that education, a laboratory with appliances of a modern type would be required?—Certainly.

6000. Does a suggestion commend itself to your mind which has been made to us by several witnesses. Supposing the College of Science in Dublin were remodelled and thoroughly equipped after the fashion of one of the great German Technical Colleges, might not the technical portion of a student's education be conducted in that College of Science, while the portion of his education of a purely academic or University type were given in one of the teaching Colleges in Dublin?—My answer to that would depend on what you class under the head of his Technical Education training. I think it would be an entire mistake to limit the equipment of the University in any respects on account of having that well-equipped College of Science in the same city. The University should be first thoroughly equipped for all Pure Science.

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6001. Pure Science?—Yes; and I think some other branches of what are usually called technical subjects had perhaps better also be kept to some extent in the University. I have given the example of Electrical Engineering. I think that is a subject which involves so much advanced theory that it would be a mistake to take it away altogether from the University.

6002. The University should be thoroughly equipped for its own purposes?—Certainly.

6003. It may not be easy at this moment to define what those purposes are, or to draw a line between those purposes and the purposes of a Technical School. But, in so far as the teaching in a Technical School lies outside the domain of University Education, it would be possible to co-ordinate the two institutions, would it not, and for the University to avail itself of the very elaborate and expensive equipment which is now required?—Oh, for the University to avail itself of the equipment for its purposes?

6004. For its purposes?—I think that would be a mistake. I think for the work the University should do, the University should be equipped to enable it to do it by itself. I do not think you should put up apparatus outside what is necessary for the University; I think the University should have that of its own.

6005. I do not mean apparatus only. I mean courses of instruction?—Of course, I do not mean that you should keep too much in the University; I suggest that some subjects should be kept in—some subjects which are classified as technical subjects, such as I have given.

6006. I am not suggesting anything to the contrary. You think that all the necessary apparatus for the purpose of teaching those subjects should be in the University or University College, whichever you choose to call it?—Yes.

6007. You called attention in your interesting remarks to the great necessity for making provision for research?—Yes.

6008. I suppose it is really to the provision that has been made abroad, and in England, for research that the great discoveries are due, which have advanced industrial Science so much during the last few years?—Certainly.

6009. These advances would not have been made if the attention of Professors and learned men were devoted simply to teaching; you would get on no farther than you are at the present moment if you were simply teaching?—Certainly.

6010. Your suggestions, I think, are two-fold: that the staff of a teaching College or University should be so arranged as to afford time for research?—To afford time, certainly.

6011. And that, secondly, a stimulus in the form of Fellowships or Studentships should be awarded to persons successful in research?—Yes; that scheme, I think, would both reward the research work and, therefore, encourage it, and it might also be used, to some extent, to supplement the teaching staff. Persons getting the research Fellowships might be required to do a little teaching.

6012. You referred to the encouragement given to research in Cambridge. Is similar encouragement given to research in any other of the English Universities?—Even at Cambridge it is only of recent years. These regulations as to research, to which I have referred, were passed only six or seven years ago, and since then the research work has increased very much. Oxford, I think, has not done very much in that respect yet, though they did form a new Chair of Electricity about a year ago, which is a move in the right direction.

6013. Are you aware of any work done by the London University in that direction? Hitherto it has been merely an examining body?—Of course, work is done in some of the Colleges which are attached to London University.

6014. Do you know anything of the work in the London Colleges—whether special encouragement is given to research in any of the Colleges which are now affiliated with London University?—I think you will find that all these colleges in recent years are moving in the direction of encouraging research; it is rather a movement which has taken place in recent years.

6015. Most Rev. Dr. HEALY.—I am glad that you emphasised the necessity of University equipment in the scientific department, no matter how many Colleges of technical Science there might be in the neighbourhood?—Certainly.

6016. For instance, supposing a College of Science were built, and equipped as a Technical College, I suppose that in Trinity College they could not do without the scientific equipment that they have in their various laboratories at present?—No, they certainly could not do without it; they would require more, if anything.

6017. That is what I want to bring out. They would not dream of closing their laboratories?—Certainly not.

6018. They would need them still?—Yes.

6019. Of course, the equipment in the Technical College would also be useful for students when they could go there?—Oh, yes.

6020. For instance, suppose you were to get another University College in Dublin, to do justice to that establishment it would require a complete scientific equipment such as they have in Trinity College?—More perfect, perhaps.

6021. They would perhaps require a more perfect equipment than they have at Trinity College?—Yes. I do not think Trinity College will think I have said anything wrong when I say they are not fully equipped.

6022. Any University College in Dublin that undertakes to do Scientific work as a University College, will need to have what you call a complete equipment?—A complete equipment, yes.

6023. A great many well-equipped laboratories would be required for that purpose under a complete and well-equipped University?—To get a complete answer to that, you will require the Professors of all the scientific subjects.

6024. All the scientific subjects that are usually taught in a University. Can you give me an idea, that is what I want, in reference to the expense chiefly, I am speaking?—I dare say you would require eight or ten laboratories. But that number is given off-hand, without counting up the different subjects.

6025. And the equipment of those would be very expensive, I understand?—It would be very expensive, certainly.

6026. Would it be possible for you to give an idea of the expense for a complete equipment?—I would rather not put in a figure.

6027. At any rate a large sum would be required?—A large sum would be required, yes.

6028. Notwithstanding the fact that you had a scientific Technical College in the city?—Notwithstanding that fact.

6029. Professor LORRAIN SMITH.—You spoke of the lack of equipment in Ireland?—Yes.

6030. How would you compare the equipment in Ireland, speaking generally, with that of England, not to go to Germany?—You mean equipment principally for scientific teaching?

6031. For scientific research, yes?—I think the equipment for scientific research in all the Colleges in Ireland is very, very poor.

6032. Is it to be compared with that in England in regard to teaching?—You mean actual teaching for examinations?

6033. Actual teaching for the examination of students?—In one sense, I think it would compare very favourably. Compare our Honours students here. I think they know a very large amount when they get an Honours degree, but the question is whether that is exactly the sort of knowledge. It is too theoretical.

6034. I will come to that in a moment. As regards teaching it might compare favourably?—It might compare favourably.

6035. As regards research?—Very unfavourably.

6036. We are really very far behind England and Scotland in regard to research?—Well, I am afraid the Scotch Universities are not very efficient as regards research, but we are certainly very far behind, say, Cambridge, as regards research.

6037. You have sketched one or two modifications of the course for the higher degrees in Science—M.A., D.Sc., or whatever it may be?—Yes.

6038. It would be an essential part of your plan that teaching for those subjects should be collegiate; I mean, in the sense that would not be open teaching, as at present exists in the Royal University?—Oh, no; certainly it should be collegiate.

6039. There should be attendance at classes necessary?—Attendance at classes should be necessary.

6040. The present method of a man coming up for a degree in Engineering, without attendance at any recognised classes would be altogether out of place?—Out of place entirely.

6041. I was very glad to hear your remarks on the provision for research in the arrangements as to the size of staff and so on. In regard to the teaching, which you have sketched, you say that the senior students should have at least two years of research. Would you contemplate, then, that a Professor who

was supervising such students might be regarded as teaching?—Certainly; he would be teaching them. He would be teaching them more effectively than he would be by lecturing to them.

6042. So that you would not even necessarily ask a Professor to lecture all the year round?—Some Professors might lecture three times a week, but some others might not be lecturing so much as they will be guiding other men's work.

6043. The point I wanted to bring out was this, that in counting up the time which any institution might regard as demanded of a person holding office as a Professor, the time that he spent in supervising research might count?—Certainly.

6044. In just the same manner as teaching advanced classes of students?—Quite so.

6045. You would develop the principle of providing for research—if that were the principle recognised?—That principle should be recognised certainly.

6046. Dr. STARKIE.—You have stated in your evidence that you know of no College in Ireland that is at all sufficiently equipped for the purpose of research work in Science. I know you have been educated in the Queen's College, Galway, and I should be glad if you would tell the Commission whether it is possible there to carry on the work of research to any extent?—The causes I have mentioned as operating against research work hold in Galway the same as in other Irish Colleges; the equipment is not sufficient, and the staff is not sufficient.

6047. Did you attend the present President's lectures?—Yes.

6048. What is your opinion of the equipment of his laboratory? I know that a good deal of money out of the comparatively small grant to Galway has been spent on the laboratory, and I should like to know whether the equipment of it would satisfy your ideas?—The Physics laboratory in Galway was very much improved—I suppose as much as it possibly could be improved with the means at hand for improving it, but still I think Professor Anderson would agree with me that it required some further improvement.

6049. Was any research carried on in Galway?—Oh, yes; research was carried on in Galway.

6050. I suppose it would be true to say that there is a good deal of research work done in the chemical laboratory?—Yes, in the chemical laboratory. There is always some research work going on there, and I think you might say the same about the physical laboratory.

6051. Even work outside the course of the University?—Outside the course of the University, undoubtedly.

6052. That is an interesting point, because I do not think it is generally understood that, although the College is under the very rigid courses prescribed by the Royal University, still there was work of the highest type going on in the laboratories there?—I think there was, too. I may mention that you may take that as proved to some extent by the fact that since those research degrees have been established at Cambridge, two research students from Galway have obtained them. Another student, Mr. Ryan, did work in Germany.

6053. The point I wish to bring out is this, in Galway, though the facilities supplied for the encouragement of research are not sufficient, at any rate the taste for research has been fostered?—The taste for research has been very much developed in some of the higher classes.

6054. That is strongly in favour of the methods of teaching in the College?—Very much in favour of the teaching in Galway.

6055. Consequently in your opinion the College in Galway cannot be justly described as an "absolute failure," as some witnesses have asserted?—By no means. My own opinion about Galway is that the one objection that can be urged against it is that the number of students is rather small, but the class of work done is very high.

6056. Although the students entering the College for years are not as well educated as the Professors would desire, still after spending three years in Galway your experience is that they showed a very great improvement?—That is my experience.

6057. Especially in Science?—In Science; my whole evidence principally refers to it.

6058. I would like you to amplify your remarks as to the difficulties they had to contend with in Galway. I suppose that the first great obstacle to doing good work there was the too great number of lectures imposed on Professors. You spoke of your work in Dublin involving ten or twelve hours' lectures in the week, but would it not be true to say that a Professor in Galway with lectures for ten or twelve hours a week would not have so much work to do as many of the other Professors?—That is so. The Professor in my own subject would have to give as many or more lectures in Galway than in Dublin.

6059. And in Literature and Classics some of the Professors give as many as twenty-four hours of lecturing in the week?—I believe that is so.

6060. What is the cause of that—is it not due to the system of the Royal University?—It is due to two causes. There are too many examinations to be prepared for, and the staff is too small.

6061. And thirdly, might not you say, that the examinations not only are too many but the courses prescribed for each examination are too numerous and too much split up?—That may possibly be so.

6062. Take the case of Literature, English Literature, you know it is the practice in the Royal University to prescribe the actual books that must be read?—Yes.

6063. For example, there may be different plays of Shakespeare for different examinations and the consequence is that Professors have to give separate lectures in separate classes on each of the plays of Shakespeare prescribed?—Yes, that would follow.

6064. For instance, the Professor of English Literature may have to lecture nine hours a week on Shakespeare on account of the way the course is split up?—Yes.

6065. Is not that so?—That may be so.

6066. I suppose you would agree with me in holding that the chief evil of every centralised authority like the Senate of the Royal University, which prescribes rigid courses is that in the Colleges the teaching follows the examinations?—Certainly, that is the great objection to the present system.

6067. And I suppose your opinion is that that would lead to the destruction of all originality and individuality in the work of teachers?—Certainly.

6068. Of course, from what you have said already, it would appear that you would not have the very highest opinion of that kind of teaching?—No; I think you could substitute for that teaching teaching of much greater value.

6069. The fact is, in your opinion for good work to be done in a College it must be independent or autonomous?—Largely independent, yes.

6070. And that the teachers should have the prescribing of their own courses?—To a very great extent.

6071. With certain checks, perhaps. Are you of opinion that another of the causes of the comparative ill success of Galway is the fact that, as you point out in your summary here, the leaving of the best men to work elsewhere has a depressing effect both on the Professors and students of any College, and you say yourself in illustration of that very evil that there was no inducement to remain on to work in Irish Colleges?—The equipment is not complete, the staff is too small, and the Professors have not much time to devote to research.

6072. Even supposing the equipment in Galway was excellent and the staff was large, on account of the way the Professors are appointed it has been the general experience of Queen's University men originally, and Royal University men in recent years, that there was very little inducement for them to remain on in the Colleges, since the powers that be generally have shown no inclination to appoint Queen's College men or Royal University men to vacant Professorships?—I think that is true.

6073. I dare say there is a further reason, that even if they had a prospect of being elected to professorships, the professorships are not of such great value as to be attractive?—No, they are not of great value; but still professorships are not so easily obtained that they can be treated with disrespect.

6074. Leaving out of sight the pecuniary considerations, the class teaching that up to the present has been rendered necessary by the Royal University system of examinations is not of such a high type as to attract the best men?—To a man who is anxious to devote a good deal of time to research work the class of teaching necessary for the Royal University would not be attractive.

6075. To scientific men I am glad to say that it is a more important matter than pecuniary considerations?—It should be, and I think in a great many cases is.

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John Alexander M'Clelland, Esq., M.A.

6076. Professor DICKEY.—I suppose that research work can only be undertaken at an advanced stage of a student's career?—Yes, an advanced stage, but still I think there is a danger in keeping it off too long.

6077. You say after the student takes a three years' course?—After three years of lectures and text books that the Honours student should be in a position to begin research work.

6078. And it then requires some six or seven laboratories to have this work carried on successfully?—A good laboratory in each scientific subject.

6079. Your opinion is that this equipment should be provided for each University College?—For each University College, certainly. The remarks I have made here apply to the teaching for a University wherever it may be.

6080. Mr. STARKIE.—You say that the student might devote himself to research work after a certain number of years at text books, but do you think a student whose only mental pabulum has been the study of text books is likely, human nature being what it is, to betray any desire later on to devote himself to research work?—That is the reason why I would not keep them too long at text books.

6081. If you keep them at text books at all?—Yes, the less text books students would require the better for them.

6082. It has been suggested that in any reconstruction of the Queen's College, Galway, provision might be made for a strong Technical Department of Agriculture. From your knowledge of the conditions down there, do you think there would be likely to be any demand for such a department, or that it would be likely to succeed?—I am afraid that is a question on which I could not offer any opinion worth very much.

6083. Of course, I assume that the objections at present against the Queen's College might be removed. Suppose that the College was favoured by all parties in Galway, do you think there would be any opening for the development of the College in that direction?—I always held the opinion that the chief objection to Galway was the small number of its students. If the causes which keep the number so low can be removed, I don't see why it should not be a success. That is my position as regards Galway.

6084. In that connection would a department of agricultural and technical instruction be desirable?—Certainly. Technical and agricultural instruction is very much required in the West of Ireland, but whether you would have any big demand for it is another question.

6085. The law of supply and demand does not hold in the case of education; you have to create the demand and then supply it, or the supply very often creates the demand?—That is so.

6086. Most Rev. Dr. HEALY.—There is one thing I wish to ask. I think you pointed out very clearly the necessity of an adequate scientific staff to do the highest University work. What I wish to know is this. Suppose in your own department, Physics, or Natural Philosophy, could that assistance be given to you by qualified lecturers, or would you require a number of Professors of the same position as yourself?—The subject of Natural Philosophy includes Experimental Physics, as well as Mathematical Physics. I think Experimental Physics would require one Professor and several lecturers.

6087. In the scientific department generally, would the Professors need lecturers, or, if they were to get assistance, would it be independent Professors?—I think you might develop it more in the way of one Professor in each subject and a number of lecturers.

6088. That would be sufficient?—You must appoint very good men to the Lectureships. It is more a matter of name.

6089. It would be an important matter; still, in regard to cost, I suppose lecturers would not cost as much as Professors?—No.

6090. Professor LORRAIN SMITH.—Would you have another Professor in Mathematical Physics?—I think Applied Mathematics would require an independent Professor. In some places Applied Mathematics are treated in conjunction with Pure Mathematics, but in Ireland Applied Mathematics and Experimental Physics have gone together always. I think you would require a separate Professor. Possibly something might be done in the way of taking Applied Mathematics with Pure Mathematics. I think it would be better to keep a Professor of Pure Mathematics, a Professor of Applied Mathematics, and a Professor of Experimental Physics.

6091. Most Rev. Dr. HEALY.—Suppose you had an Agricultural School in Galway, I suppose several of the scientific Professors could do valuable work in connection with that school, in Botany and Zoology, &c., &c.?—No doubt they could do very valuable work.

6092. Suppose there were a number of Agricultural Schools throughout the country generally, where teachers would be required, would not that do something to create the demand for Agricultural Education in the College to which Dr. Starkie referred?—You mean that students anxious to be teachers would go to the College?

6093. Yes?—Certainly, I think they would.

6094. Especially if there were an Agricultural School in the College to attract them and to help them?—Yes.

6095. In that case you think there would be a very considerable number looking out for Agricultural Education?—There should be.

Witness.—I might add that I should like to see it rendered impossible in scientific subjects for students to come up for examination without giving some guarantee that they had attended some institution where practical work could be attended to.

6096. Mr. Justice MADDEN.—You attach great importance to teaching, as distinguished from examinations, in this subject?—Yes. I realise that it may be a hardship to students, in some cases, to refuse to admit them to examination, but still in Science subjects I really think a student does not gain very much if he only reads text-books, and does not get proper instruction.

The Witness withdrew.

Mr. Justice MADDEN.—We have not been able to obtain at our present sitting oral evidence as to the provision for higher Technical and Commercial Education, which has been made by the University of Birmingham. This want may, for the present, and, to a certain extent be supplied by printing in our Appendix the report with which we have been furnished of an Advisory Committee, appointed in connection with the promotion of the University of Birmingham, which deals in some detail with the subject of our present inquiry.*

* See page 318.

This concluded the Second Session of the Commission.

THIRD SESSION.

LONDON.
Dec. 16, 1901.

FIFTEENTH DAY.

MONDAY, DECEMBER 16, 1901.

AT 11 O'CLOCK, A.M.

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C. (in the Chair); The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; Professor JOHN RHYS, M.A., D.LITT.; Professor JAMES LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT.D.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

SIDNEY WEBB, ESQ., LL.B., Chairman of the Technical Education Board of the London County Council, and W. GARNETT, ESQ., D.C.L., Secretary of the Technical Education Board of the London County Council, examined.

SIDNEY WEBB, LL.B., L.C.C., examined.

6097. Mr. Justice MADDEN.—Mr. Webb and Dr. Garnett, we propose at our sitting to-day to continue our inquiry into Technical Education, using the term in its widest sense, in its relation to University Education. As you are both intimately connected with the same body—the Technical Education Board of the London County Council—it is convenient that you should be present at the same time, in order to avoid unnecessary repetition of evidence. Mr. Webb, you hold the position of Chairman of the Technical Education Board of the London County Council?—Yes, sir; I am Chairman. It is an annual appointment. I am Chairman for this year, and I have been very intimately connected with the Board from its start in 1893.

6098. What are the functions of the Technical Education Board?—The Technical Education Board is the committee appointed by the London County Council under the Technical Instruction Acts. To that Committee the London County Council delegates practically all its powers under the Technical Instruction Acts. The Committee is appointed by the Council annually, and it has to submit to the Council its proposed budget. The Council passes that budget in its annual estimates, and then, after passing the budget, leaves the disposal of the sum, and the entire administration, to the Technical Education Board.

6099. The Board, I presume, is charged with the interests of Technical Education in regard to Primary and Secondary Schools, and also to Universities?—No; not to Primary Schools.

6100. Not to Primary Schools?—The Technical Education of children in the standards of the Elementary School is definitely excluded from the Technical Instruction Acts. But there is no other line limiting our action, so that I may say we have the whole of technical instruction, except in the Primary Schools. Would you allow me to make a statement which I should like to put on the notes? Perhaps, I may say at the outset that I am very glad to attend here, and give any information in my power to the Commissioners, but I ought to add that I am entirely unacquainted with the circumstances of Irish University Education, and, therefore, I am not in a position to give evidence, properly so called, with respect to it. I should like it also to be understood that, of course, Dr. Garnett and myself attend here without having consulted the Technical Education Board, and entirely in our personal capacity. I should wish that that may be clear, so that there could be no possibility of misapprehension on the part of the Technical Education Board.

6101. Then, the information that we can derive from you relates to the experience of London in its endeavour to promote Technical Education of a University type?—Yes, that is so. I may say that we have always, from the beginning, taken the widest possible view of Technical Education, and we have had in view from the beginning the very great importance of developing the highest technical instruction, and, therefore, we may venture to say, of a University type. Sidney Webb, Esq., LL.B.

6102. I presume you look forward to developing that type of Technical Education in connection with the London University?—Yes; it has been my view, very strongly, I may say, that there should be no divorce or separation of the Technical Institute of a University standard and the University properly so called; that Technical Education of a certain grade should be included in the University course, whatever the subject.

6103. Perhaps you would tell us what has been done up to the present by the London University for the promotion of Technical Education of a University type—since its re-constitution?—I am afraid that since the actual re-constitution of the London University the Senate has been entirely employed in the preliminary work of organisation, and, therefore, the University, as a new University, cannot be said at present to have done anything except to prepare the machinery. But, of course, the Constituent Colleges of the London University have been, for the past ten or fifteen years, steadily increasing and improving their work on the sides of Science and Engineering, and there have been new developments in Economics.

6104. Perhaps you would tell us briefly what has been done by the constituent Colleges in that direction?—At University College, for instance, the chemical department, under Professor Ramsay, has been very considerably extended, and has now, I believe, a research laboratory of a practical type, not surpassed, for its size, by any other, in the Kingdom, at any rate. Then, in Electrical Engineering and Mechanical Engineering, University College has improved its schools, which are doing very excellent work, we believe, but they have been starved from lack of funds. They are carried on at extremely small salaries to the Professors, and with extremely scanty assistance in relation to the Assistant Professors and demonstrators, and with imperfect equipment. But, still, they have enormously improved, and with the Chemical and Medical departments they constitute, to my mind the most vital part of University College at this moment. And, similarly, at King's College, the Engineering and Electrical departments have been very greatly extended, and there, too, those departments constitute, perhaps, with the Medical School, the most vital part of the work of the College.

6105. Are they sufficiently equipped at King's College with the necessary laboratories and apparatus?—Not at all sufficiently.

6106. Then, neither of those constituent Colleges appears to be sufficiently equipped for the purposes of Technical Education?—Certainly not; neither of them,

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as constituent Colleges, is sufficiently equipped. They are quite under-staffed, and under-equipped, and underpaid.

6107. The expense of equipment in the light of modern ideas is very considerable, is it not?—Very considerable, and constantly increasing. I should say that the Technical Education Board has, for some years, made an annual grant of £1,500 to each of those two Colleges for those departments out of what is popularly called the "Whiskey" money. I give that as an instance of the effort to encourage their work.

6108. Is there any other College of a University type in London promoting Technical Education?—I ought first to point out that Technical Education under the Act of Parliament has so very wide a definition that it would let in nearly all the faculties of the University, except, as has been popularly said, Theology, Greek, and Shakespeare. But I would observe, for instance, that all the whole sphere of Mathematics and Physical Science, Modern Languages, Economics—all these fall within the range of Technical Education, and in all those departments there have been very great advances made during the past decade, not only at University and King's College, but also at Bedford College, for Women, which is a school of the London University, and the Holloway College, which is also a school of the University. And for Economics and Political Science there has been a new school established—it was established seven years ago—The London School of Economics and Political Science, which is now part of the University. So that in all these branches, in all the range of technical instruction under the Acts of 1889 and 1891, there has been an enormously developing interest manifested during the past decade, very largely in consequence of those Acts.

6109. The expression "Technical" Education, not only etymologically, but as interpreted by the Act of Parliament, has undoubtedly a very wide application, but the branches of Technical Education that interest us most in Ireland are the branches concerned with the practical teaching of Science, in such departments as Engineering and Chemistry; higher scientific education, as applied to Agriculture, and what is known as "Commercial" Education of a University type. That is not an exhaustive enumeration of the branches of Technical Education, but these are the branches in which we are most interested?—I think, if I may say so, that that is the practical definition which I have been actually following. I have not gone beyond that range. I ought to have mentioned, as another of the schools of the London University, the Central Technical College of the City and Guilds' Institute, which stands, I may say, in the first rank as regards all branches of Engineering and Chemistry. That is a creation of the past decade. Then, with regard to Commercial Education of a University type, I think we look for that to the London School of Economics, which has made a speciality of specialised instruction of what I may call a University type or standard, for all branches of administration, including the administration of business, of railways, of banks, and of insurance.

6110. Has that body any relations with London University, or with any of the University Colleges?—That body is a University College. It has been admitted as a school of the University, and there is a separate degree instituted for its subjects. There is a separate Faculty of Economics in the University, and there is to be a separate degree for the Faculty of Economics. That is to say, that higher Commercial Education has been recognised on the same footing as Law, or Medicine, or Engineering, as a separate faculty of University study, so it has a separate curriculum and a separate degree.

6111. In order to attain that degree, is it necessary for a student to have followed an Arts course, and, if so, to what extent?—No; it is an entirely distinct faculty. I should like to point out that the development of London University in recent years has been in the direction of separating off from the Arts' Faculty, separate new faculties, beginning, of course, with Law and Medicine, and going on to Science, and now, also, adding, as separate faculties, Engineering, Economics, and Theology. I find I have omitted Music. There are, in all, eight faculties in the University.

6112. Would you kindly tell us, Mr. Webb, the faculties now recognised in the University of London?—Arts, Science, Law, Medicine, Theology, Music, Engineering, and Economics.

6113. Are those faculties prescribed by the statutes made for the University by the Commissioners appointed under the Act?—Yes; and I should say they are entirely distinct—that with none of them is the Arts Faculty a preliminary.

6114. But I presume a Matriculation examination is required?—Yes, that is required.

6115. As evidencing a certain amount of training in the liberal Arts?—Yes.

6116. Most Rev. Dr. HEALY.—You mean there is no degree in Arts required?—No degree in Arts is required before proceeding to the other degrees.

6117. Mr. Justice MADDEN.—And, as I understand, a matriculated student who aspires to one of those special degrees is not required to continue an Arts course?—No; each faculty has its own curriculum starting from Matriculation. Of course, some of those curricula will include some subjects which are to be found in an Arts curriculum. That is obvious.

6118. I presume each of those courses leads up to a separate degree?—Yes, each leads up to a separate degree; but the degree has not always a separate name.

6119. Now take, for instance, Engineering?—The student in Engineering will take the degree of Bachelor of Science in the Faculty of Engineering.

6120. What occurs in the case of Economics?—He will take the degree of Bachelor of Science in the Faculty of Economics. I should like to point out that the department of Economics has been divorced from Arts, and is placed in Science.

6121. I think you said that these special courses leading up to degrees had in themselves some of the elements which are also contained in the Arts course?—Yes. For instance, Mathematics, which is a prominent part of the Arts course, forms also a prominent part of the Science curriculum, the Engineering curriculum, and the Economics curriculum.

6122. But the literary portion of the Arts course, I presume, does not enter into these special curricula?—Only to a comparatively small extent. History, for instance, enters into the Economics course, Modern Languages are required in the Science course, in the Engineering course, and in the Economics course.

6123. But neither of the Ancient Languages, I presume, is included in the Science course?—No; they are included only in the Arts and the Theology curricula.

6124. You suggested that the development of Technical Education in London in connection with the University system had not yet been completed?—No; it is very far from complete, owing to the lack of funds.

6125. What would be your idea as to the proper relations between a University and a School of Science of a technical character?—In London we have worked it out in this way: that as the area is so large that it is impossible to concentrate all the University teaching or all the University students in a single building, it is convenient that special buildings and special institutions should exist for particular groups of subjects. It is a moot point how wide those groups should be. But at any rate, there must be, to a certain extent, a segregation by subjects. For instance, the Central Technical College is a school of the University which professes to deal only with the Engineering Faculty. It includes a great deal of Science—Physical Science—but only as an adjunct of the Engineering course. That has been an extremely successful institution, and we contemplate that it will continue to be equally successful as a school of the University. Its teachers are recognised as teachers of the University, and are members of the Faculties and Boards of Studies, and by that means, also of the Senate; but the Senate of the University has no direct control over the management of the School or its funds. That is an instance of the inclusion within the University of an entirely independent College for a special subject. The London School of Economics is a similar instance of an almost exactly identical relationship in the Faculty of Economics. Then you have in London large Science and Engineering departments, in University College and King's College, which are not specialised to one faculty, but which try to give instruction in nearly all the faculties. It remains to be seen how far that will be possible. My own personal view is that in the circumstances of London the segregation by groups of subjects is better than an attempt to provide a number of small Universities, each of them complete in all the faculties.

6126. The circumstance that you have adverted to, that a properly equipped laboratory, which, of course, involves great expense, is essential for the purpose of teaching Practical Science, tends in the same direction?

—I think so; not merely with regard to the question of expense, but also with regard to the question of space—the very great amount of space required. It has become impossible, for instance, for University College, built as it was more than half a century ago, to accommodate adequately all the departments which the modern University now covers, with the necessary space, even if it had the necessary funds.

6127. The London University, until the recent reforms, was purely an Examining Board?—Yes.

6128. It continues to grant degrees by examination; but it is also a teaching University, from its connection with the affiliated Colleges—is not that so?—Yes; that is the state of things at present.

6129. Well, what is the exact nature of the affiliation—taking the Economics College, for instance, what is the exact nature or character of the affiliation with the Economics College for the purpose of obtaining a degree in Science in the Economics Faculty? To what extent is the teaching in the Economics College recognised and adopted by the University as leading up to this degree?—The Senate of the University imposes the courses of study which it will recognise as qualifying the students to be regarded as internal students of the University; and it, of course, prescribes the examinations on which alone it will give the degree. So that in that way the Senate retains absolute control over the instruction which it will recognise, and the degrees which it will confer. The Senate will probably provide, and pay, a certain number of direct University teachers; but there are none such at present. At present the teaching is entirely given by the staffs of these respective institutions, which are financially independent of the University. They are obliged to conform to the Senate's requirements, because otherwise, their students would not be eligible for an internal degree. I may say that that connection has, hitherto, worked quite smoothly. Perhaps the link is found in the Boards of Studies. The Boards of Studies are appointed by the Senate from amongst the actual teachers of the subjects. Therefore when they are sitting upon the Boards of Studies the teachers are all collected together for their own subjects, and the Boards of Studies make recommendations to the Senate as to the character of the course and the character of the degree examinations, which the Senate is free to adopt or reject, as it pleases; but in that way the teaching staff of the several institutions is able to make its opinions heard by the Senate, and, of course, to secure a considerable deference to its views as to what should be the curriculum from the Senate, though without any authority.

6130. Are you in a position to give any further information with regard to the connection between the London University and the various Boards engaged in the teaching of Technical Education?—I should like to point out that this peculiar affiliation of separate institutions to the University is not confined to the actual area of London. It cannot be without relevance to your inquiry to remind you that, included within the University of London there are now schools at Egham, the Royal Holloway College, which is, I think, fifteen miles from London; and certain theological seminaries in the Faculty of Theology which are fifteen or twenty miles away from London; and also the Royal Agricultural College at Wye, in Kent, which is, I suppose, fifty or sixty miles from London. And therefore, it is possible to include, in one teaching University, as, indeed, has been found in the North of England, teaching institutions widely separated in the geographical sense.

6131. You have referred to the Agricultural College at Wye—what is its position in connection with the London University? In regard to what degree are its studies available?—There is no agricultural faculty and no agricultural degree; but it is admitted as a school of the University in the Faculty of Science for the special subject of Agriculture. I do not think that any of its students at present proceed to the degree in Science; but it is hoped that they may in the future.

6132. Most Rev. Dr. HEALY.—I understand that, generally speaking, Mr. Webb, you would be in favour of having a close connection between the Technical Institute and the University with which it is connected—a very close connection?—Yes, a very close connection; I believe that that is very important for the technical studies, and, I venture to think, no less useful to the University.

6133. That is what I wanted to elicit. You would, therefore, recommend, based on your own experience, that it would be desirable to make the Technical Institute a constituent College of the University?—Yes, assuming that its instruction is above Matriculation standard.

6134. Provided its standard is up to the mark. And for that purpose you would require, first of all, a Matriculation examination?—Yes; but I should like to point out that we have found it convenient and, indeed, necessary, in London, not to insist on the University Matriculation as a condition of entrance to the separate Colleges. There are many students, even at University College, who have not matriculated; and I should like presently to describe the connection with the University of institutes in which only a very small part of the instruction is of a University standard. But the Colleges which I have hitherto been speaking of aim at a University standard of education.

6135. Is it usual for those students who do not matriculate at their entrance to the College to matriculate afterwards?—Yes, that is very common among those students; but there are many who never matriculate.

6136. What influence have the University authorities in shaping the courses of the Technical Institutes?—Hitherto they have not had any influence, but in the future they will have, practically, complete influence by their power of prescribing the courses of study which alone they will approve of as admitting for the internal degree.

6137. Have they any influence in the selection of the teaching staff for the Technical College?—They have no direct right of appointment or of veto, but they have the absolute power of recognising, or not recognising, any such teachers as University teachers. Consequently, while the governing bodies of these Technical Colleges have an entirely free hand in appointing whom they will, the Senate reserves to itself the right of not recognising any person so appointed.

6138. Perhaps it is premature, at present, to form an opinion, or even to ask the question, but do you know, as a fact, whether the governing body of a College in such a case would give any intimation to the authorities of the University as to the gentlemen whom they proposed to appoint?—Hitherto, that has not been done. It is quite possible, however, that it will practically work out in that direction unofficially. I should think so.

6139. One would expect that it would work out in that direction; but you are satisfied that if the governing body, in any case, were to appoint a person incompetent to discharge the duties of any Chair in the institute, that the Senate would probably not recognise him or his teaching?—Quite so. As a matter of fact, the Senate has already refused a very large number of applications for recognition, distributed over all the institutions, from University College down to the Polytechnics. The Senate has shown itself quite strong in its personal view; perhaps it has been a little too strict, because it has chosen to insist upon actual research by the teacher, in addition to teaching ability.

6140. But it is your opinion that it would be very desirable that the Senate, nevertheless, should retain and use its influence directly or indirectly, first, in the appointment of Professors, secondly, in shaping the courses of study, and, thirdly, in the examinations for the degrees—in those three respects?—Yes, that is my view, assuming that the institutions have some direct means of pressing their technical views upon the Senate.

6141. Some direct means?—Yes.

6142. Therefore, you would probably think it desirable, from that point of view, that the Boards should be represented on the Senate, or on the governing body of the University?—Yes, in some form or another. It is a point involving some little difficulty, whether the governing b dy or the professoriate should be represented, or both.

6143. Would you think it desirable that both should be represented?—I think, as a general answer—yes; but that is subject to so many conditions as to the size of the governing body and the size or number of the bodies to be represented.

6144. With regard to this Agricultural College at Wye—you say it is fifty or sixty miles from the University here, in London?—Yes.

6145. Is it a constituent College of the London University?—Yes.

6146. Are its Professors in its scientific department connected with Agriculture recognised as teachers of the University?—Yes.

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6147. Do they hold preliminary examinations or Matriculation examinations?—No; hitherto all the examinations have been held in London.

6148. Are the students of that institution allowed to compete for any of the University prizes?—I think not, hitherto.

6149. Do you think that such is likely to be the case in future?—Yes; I should hope that the instruction in Chemistry, for instance, and Geology, would be so good that their students would be equal to any other University students.

6150. Have you a good many students attending that College?—No, I am sorry to say, we have not. I do not know the number; but it is not large.

6151. Do you know what staff they have—I do not wish to trouble you if you do not know?—I think that three or four of their teachers have been recognised as teachers of the University; but their staff would comprise other teachers beside those.

6152. I gather from that answer of yours, and it is important, that the University may recognise some of the teachers of a technical institute as University teachers, but not all?—Yes, that is so; and that has been the case in several institutions in London. In no institution, not even University College, which is the oldest of all, have all the teachers been recognised.

6153. Professor LORRAIN SMITH.—In what sense is a College recognised by the University?—A College is only recognised in being admitted as a school of the University. It is difficult to say exactly what that implies. It does not really give the institution much more than a titular rank. Its teachers have still to be individually recognised; its courses have still to be individually approved, and its students have still to pass all the University examinations; but there may eventually be some concession to the schools of the University in the direction, perhaps, of having University examinations held in their buildings, and, possibly, of accepting some of their own examinations in lieu of the earlier University examinations.

6154. There is no such thing as the Professors of the constituent Colleges being *ex-officio* University teachers?—No; that was a point which was very strongly and very consistently negatived by the University Commissioners, who have insisted that each teacher should be individually recognised whatever institution he belonged to.

6155. To pursue that point one stage further. Is there, in your opinion, an inherent objection to holding University examinations in the constituent Colleges?—No, provided that the University retains a sufficient guarantee for their standard. I may point out that in some subjects it may even be indispensable. For instance, it has been pointed out to us that there may be the case of an Engineering student, who may be engaged in the construction of a bridge, and it may be most necessary that this practical work should be taken into account in his examination, and you could not move the model of the bridge. Therefore, in the cases of some subjects the practical examinations must be held on the spot; but they might, of course, be held by the University authorities, if it is thought desirable.

6156. Does the University, in holding these examinations for these different Colleges, have any special arrangement for making the examinations identical in all subjects?—Hitherto there have been no separate examinations. It is only a possibility. Of course, the Senate will, undoubtedly, take care that they should be equal as regards standard.

6157. You think it is not necessary to have them identical?—No. I do not think I should force that objection against the practical importance of localising examinations to a certain extent.

6158. You regard it as important to localise the examinations?—Yes, I think so; at any rate, in those subjects in which practical work ought to form a part of the examination. And there is the further view—that it is not convenient to have too large a number of students going in for examination. The London Matriculation examination at present involves the examination simultaneously of some 3,000 candidates, and that is not a number that it is desirable to increase.

6159. That is not likely to be a difficulty which we, in Ireland, would have to face. The difficulty that we have had to face has been that the University in connection with which the examinations are held for the different Colleges is a long distance from them—from the Colleges of Cork, Galway, and Belfast?—That has not been felt to be a difficulty in the past with regard to the London University examinations, because, with the exception of a few advanced examinations, they have entirely been paper work, and, therefore, they have been able to hold them, not only all over England and in other parts of the United Kingdom, but all over the world. There is no difficulty so long as you are dealing only with paper work, and so long as it does not seem undesirable to have such a very great number of papers to examine all at once.

6160. Of course, it is felt by some teachers that it makes the examination, perhaps, a little more artificial than necessary when it makes the students go a long distance to show their knowledge?—Yes; but, on the other hand, it has been very strongly urged in London by the teachers that, in general, examinations over a large area necessarily involve an external examination foreign to the teaching.

6161. That is what I was coming to, and that is put forward as being a safeguard against any lack of uniformity due to the localising?—Yes. But I am myself in favour of the teacher having, at any rate, some influence in the examination of his own students.

6162. That is, of course, what you gain when you have the examination in a local centre, with the teacher plus the external examiner appointed by the University?—Yes.

6163. And, perhaps, having an external examiner plus the teacher in the local centre, in certain cases where desirable, preserves to some extent, a uniformity—at any rate, you make a uniformity, if not an identity, which is sufficient?—Yes; I think that is sufficient. I should be in favour of that, where geographical conditions required it.

6164. Now, to pass to another subject: You spoke of the great desirability of keeping up the connection between the technical teaching and the University. You gave that as your opinion. Perhaps, I might ask you to amplify that?—Yes. In my view, the business of a University, that is to say, so far as its business is teaching, is to give a liberal education to everyone who comes into its hands, and that liberal education is required for every brain-working occupation whatsoever, no less for the engineer than for the lawyer or doctor. Now, if the Technical College remains isolated and apart from the University, it has a tendency to confine itself narrowly to those subjects which it can teach, in order to enable its students to be of practical use in their professions; and I should like particularly to point out that, in my opinion, the Medical Faculty has, perhaps, erred in that respect—that there is a constant tendency to confine the teaching of the young doctor to those subjects which can be shown to be of practical use in his profession. I think that the connection between the Medical Faculty and the University has not been close enough to achieve the result I aim at. But with regard to Engineering and higher Commercial Education, the danger is still greater, that the young engineer or the young business man should be taught only those things which he believes will be useful to him in life, and I maintain that the result must necessarily be to find those men most backward in all but technical subjects. I hold that the education should be in every sense a liberal education—that we should aim at turning out, not merely a successful engineer, but a cultivated engineer; not merely a successful business man, but a cultivated business man, just as I assume the University aims at turning out not merely a successful lawyer, but a cultivated lawyer. I think, therefore, that in order to get the best possible Technical Education the influence of a University is required, because the best possible Technical Education, in my view, includes cultivation as well as mere proficiency in technique.

6165. Now, on the other hand it has been put before us that if the Technical Institute is connected with a University, it is liable, as regards its teaching, to become absorbed by the University, and it loses its vital contact with the industries on which its teaching bears, by virtue of that connection. What would be your view as to that aspect of the question?—My practical inference as regards the circumstances of London, is that you can best secure that practical contact by having a separate governing body. Let me give the illustration of Economics, in which I have been much interested. Ten years ago, Economics was entirely a subject under the University, controlled entirely by the governing body in the University, and not represented otherwise than by its Professor. The consequence was that Economics did not progress. Some friends of the subject undertook to start a separate institute for Economics and Political Science, including the whole of the science or art of administration——

6166. Before you go further, I was going to ask you to give us the history of this very school. I wish you would do it in some fulness?—Well, we thought there was more demand for that instruction than was admitted, but that the demand had not become effective just because the subject was absorbed in the University, and had nobody to fight for it in the great tumult of London life. A little Committee established the London School of Economics entirely as a private venture, without University recognition or any authority whatever. We drafted a course of instruction, which we believed to be practically useful to the people whose education we wished to benefit. We then obtained the very best Professors whom we could acquire the services of, and allowed them to teach in the way they thought best. But we settled the subjects. We chose the subjects in very definite relation to the practical needs of the classes we wished to attract. We took care that the course should be educational in the widest and most liberal sense, but, at the same time, practical. In that way we have been able to build up an institution which has attracted many times the number of students which formerly were attracted to the Economics course inside the University College, and we believe we have done that by having a separate governing body constantly thinking about the practical application of the subject, and pushing it as a separate branch of study. I should explain that, when I say it was started as a private venture, I do not mean that it was started as a commercial concern. Of course, it was not a profit-making concern, and involved a very large expenditure on the part of the promoters.

6167. But, talking of a Technical School—just upon this point—it was explained to us by a witness who represented the Heriot-Watt College, that as regards technical subjects, it was necessary that an engineer or a commercial man should retain his connection, on the one hand, with Practical Engineering by being a consultant engineer while he was a teacher in the school. What would you say as to that?—That is a question that we have also had to consider in London in various institutions, and I may say that, whilst thinking that it would be impossible to lay down an absolute rule, I have formed a very strong opinion against the advisability of allowing a Professor to take private practice, but I do not say that I would make it an absolute rule that he should not. There are some eminent men's services which could not be obtained at all if you insisted upon claiming their whole time for the College; but, wherever possible, we have found it extremely desirable to say that the Professor should not take private practice of any sort.

6168. And, as a rule, you have acted on that?—As a rule, that has been acted on.

6169. A corresponding difficulty arises with regard to the teaching of commercial subjects; commercial technique should be taught by someone actually engaged in commerce?—Yes; but I think that that difficulty can be got over—and perhaps that would be so in all subjects—by having two classes of instructors. The Professors we require to give their whole time to the teaching of their subjects, but there could be occasional courses of lectures by men who are engaged in the practical work of those subjects. We have laid very great stress upon that in the London School of Economics. We have always endeavoured to supplement our regular instruction by frequent lectures or courses from gentlemen distinguished in their respective branches. I think, perhaps, in such subjects as Engineering, or Banking, or the principles of Accountancy, that solution might get over that difficulty.

6170. Then, with regard to Economics, do you ask for the whole time of the Professor in that subject, as well as providing those occasional lecturers?—We have separate Professors, not only in General Economics, but also in such subjects as Banking, International Trade, Commercial Law, Railway Administration, which is a very important branch, and we look forward to adding specialists in other branches of education in the future.

6171. When you talked of Banking just now: Have you a Professor who teaches Banking?—Yes.

6172. And you would add to that an occasional course of lectures by bankers?—Yes; we have done so, and we think that of very great value.

6173. Quite so?—We have found it possible, I may say, to obtain the services of men of distinction and of considerable position in the commercial world, who are willing to give a few lectures for the sake of influencing the instruction.

6174. And you would regard that as an essential element in the efficient teaching of the subject?—Yes, I would. I should say that these gentlemen do not do it for pay. It is possible to obtain their services for a very small fee, or even for nothing.

6175. I quite understand, but a problem arose in connection with the subject as to whether it was necessary to have this side which you have explained. There are some other points as to which I should like to put a few further questions to you: The Central Technical School is, I believe, carried on mainly with a view to teaching Engineering?—Yes.

6176. How far are students able to take courses, for instance, to qualify them as internal students in the several faculties in such cases?—The Science courses in the Central Technical College, such, for instance, as Mathematics and Chemistry, are recognised as qualifying for the Science degree.

6177. In whatever subject?—In the General Science degree. That is to say, a student who had attended the instruction in Chemistry at the Central Technical College would be eligible to present himself as an internal student in Chemistry for the degree in Science.

6178. In Medicine?—Similarly in Medicine—yes; but, of course, Chemistry is specialised for the particular faculty. Practically, medical students do not attend the Technical College.

6179. Under heading 3 of the summary of your evidence, which you have been good enough to hand in to the Commission, you mention that you have evening students in all the subjects?—Yes. I should like to be permitted to say that, in my opinion, it will be indispensable for any University, from now onwards, to admit to its degrees students who can study only in the evenings. I do not believe that any University in any great centre of population will be able to exclude by its regulations students whose only opportunities are for evening instruction. In the new London University it is especially provided in the statutes that there is to be no distinction between students who study in the day time, and students who study only in the evening, and the Senate is expressly precluded from making any regulations which should make it impossible for the students who study only in the evening to obtain their degrees as internal students.

6180. In the subject of Commerce, are the students evening students?—The commercial students are either afternoon or evening students, but we have also a large amount of post-graduate work in Economics and Political Science, which is carried on largely in the daytime, so that the institution is both a day and evening institution.

6181. But those students who are suggested as studying for a degree, are they afternoon or evening students?—So far as they belong to the commercial world—yes.

6182. That is what I want to make out—are they working in offices at the same time as they are studying or reading?—Yes; up to the present there has been, practically, no advantage taken by the young man who is going into business of an opportunity of spending about three years in undergraduate study before going into business.

6183. Three years would be the period for the undergraduate degree in Commerce?—Yes, I expect that we shall find that this will be always an afternoon and evening course.

6184. Yes, quite so. Now, you spoke of post-graduate work. You have only mentioned it incidentally as part of the University work in those subjects. I should like to hear your opinion on that?—My own opinion is that post-graduate work is, perhaps, the most important part of the work of any University. I do not mean that the other is not indispensable, but the status of a University and its influence upon the world of thought will certainly depend, to a large extent, upon the amount of post-graduate work that is done there. I should like to point out that, in the new constitution of the London University, provision is made for the granting of higher degrees to graduates of other Universities, and we expect that that will have the result of attracting to London, after having taken their degree, students from other Universities all over the world, in order to carry on special studies or researches in London, for which they will receive the doctorate or other higher degree. I venture to say that that provision is one of very great importance in any University, which always ought to give its higher degrees indiscriminately to graduates of any

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approved University, in order to attract men and women from those Universities, and to encourage post-graduate studies.

6185. Now, to pursue that line of argument, what provision—I will put it in this way: Are those post-graduate students internal students?—Yes, always.

6186. In what sense?—That is to say, they are always studying under a recognised teacher of the University, and I think that that is almost indispensable—that they should pursue their researches in constant contact with some authority on the subject.

6187. Then in recognising a teacher or an institution you take special account of the facility which the institution is able to afford, or the time the Professor is able to give to research?—That has been done by the Senate in London. I think, perhaps, they have done it a little too strictly, because the teaching part of the work of a University is also an important part. You may have men who are very good teachers indeed, in the fullest sense, and whose genius does not lie in research. Yet he may be the best teacher—the teacher who lives to teach. I should not like to exclude them, and to put them on a lower plane merely because they are not actually pursuing what may be called research; I mean by research, constant, original thought in an important subject, thorough and continuous.

6188. In applying the regulations in this respect regarding this subject, does it affect their recognition in any way, that an institution should teach the lower grade of work as well as the higher grade?—No; we have in London during the past ten years developed an enormous quantity of evening instruction of good quality, and are carrying it to very high grades; and, in the new London University, provision was made—after a great deal of trouble, provision was made for the recognition of teachers in institutions which were not admitted as schools of the University, and in that way it was possible to include in the University the polytechnic institutions and other evening-class institutions which did give instruction above the Matriculation standard, but which also gave a very much greater quantity of instruction of a secondary, or, possibly, even of an elementary character. That has worked so far, I think, very successfully. We have in the London Polytechnics, perhaps, over 1,000 teachers, and, of those, we do not desire to have recognised as University teachers more than forty or fifty. I mention these figures in order to show the comparatively small proportion which the University work bears to the work below University standard. Nevertheless, it is possible now for the evening students at the Polytechnics, beginning with quite elementary instruction, to carry on that instruction to Matriculation standard, and then beyond that, at the same institution, to the standard of a degree. And I should like to say that at this last examination for the Bachelor of Science degree, out of forty-two successful students, who took the degree from London institutions, no fewer than twenty had studied, wholly or partly, at these Polytechnics.

6189. That problem has been presented to us somewhat in this aspect: We will take the case of Manchester. There they will have a large Technological Institute intended, if my impression is correct, for day students of the Technical Schools, and this Technological Institute, having regard to the fact that it is teaching subjects on the grade of University teaching, ought, in your opinion, to be recognised in so far as its day classes are concerned?—Yes.

6190. And they have a large amount of evening work which is more elementary?—I should strongly advise that in any such case all the work which the institution does, day or evening, which is fairly above Matriculation standard, should be included within the University, on some such arrangement as the recognition of the teachers, which is working successfully in London. I do not think that that institution, as a whole, should be admitted as a school of the University, or be under it, but only that part of it which is above Matriculation standard should be included. I regard this as of extreme importance to the institution and to the University.

6191. Yes. It was just on that I wished your opinion, as to the practical working-out of such a solution as is suggested by those circumstances?—My experience in London is emphatically in favour of such a recognition. As I say, it has a very good effect, indeed, upon all the lower work of the institution, and it opens to the University a very large and growing class of very able, hard-working, and meritorious students.

6192. Now, on the subject of arranging what would be an ideal working system, there a e one or two points I wish to investigate. The teachers—what is the relation of the teachers, in a recognised institution, to the Senate?—They have no direct relation, except this fact of recognition; but the Senate appoints to be members of the Boards of Studies in the several subjects and in the faculties for the several groups of subjects, practically all the recognised teachers. In that way the recognised teachers, in Botany, for instance, are grouped together in a Board of Studies for Botany, and they report to the Senate upon any proposal relating to Botany. They are also a part of the Faculty of Science, and as the Faculty of Science they report to the Senate upon a proposal relating to the Faculty of Science. And thus you get co-ordination of subjects in those faculties. Those Boards of Studies are only advisory committees of the Senate.

6193. Are none of the teachers members of the Senate?—Yes. I forgot to mention that about one-third of the members of the Senate are elected by the faculties, and, therefore, by the principal recognised teachers grouped in faculties. The result is that out of a Senate of fifty-five, we have sixteen members chosen from among the principal Professors in the various institutions.

6194. The Senate of a University may consist partly of members who are teachers, and others who are examiners for the degrees. There is no objection, in your opinion, to that?—There is a slight administrative difficulty in a person who is a paid official of the Senate—as an Examiner necessarily is—himself being a member of that Senate; but that is a difficulty which, I think, is not insuperable; and, in my own view, I should desire to see a certain proportion of both Professors and Examiners members of the governing body.

6195. When you recognise a Professor in an institution as an Examiner in the University do you give him a salary?—Yes; all the University Examiners are paid.

6196. In recognising an institution like the Municipal Technical School, which gives a high grade, or University type, of education, would you regard it as necessary or desirable to recognise the teachers in the various subjects as members of the Boards of Faculties?—Yes; I think it is indispensable, because, otherwise, you would be exposed to the suspicion that the faculty was recommending the Senate so to frame the curriculum as to be unfair to this institution; whether it was so unfair or not the suspicion would arise, and, therefore, in the London University care is taken that all classes of teachers, and all classes of institutions, are represented on the Boards of Studies and the Faculties, and in that way are directly represented on the Senate. Practically it so happens that the members elected by the Faculties are all chosen from the older Colleges.

6197. Dr. STARKIE.—You have told us, Mr. Webb, that all the constituent Colleges of the University are represented on the Senate through the presence of some of the teachers; but I am not quite clear yet as to how far these Colleges are represented on the Examining Board—is every College represented on the Examining Board?—At present the arrangements for examinations are, that the Senate appoints two Examiners in each subject; consequently, there is no Examining Board apart from the Senate itself, which awards degrees on the reports of those two Examiners in each subject.

6198. And who are those two Examiners—may one come from one of the constituent Colleges, or both?—Yes. There is no exclusion of teachers from among the Examiners; but, of course, care would be taken not to appoint two teachers of any one institution.

6199. Would not the public consider it an unfair advantage to appoint Examiners from two Colleges when the other Colleges were not represented?—You cannot avoid that difficulty. At any rate, we have not attempted to provide an Examining Board representing all the different institutions.

6200. That is a real difficulty in connection with the Royal University of Ireland?—I ought to say that all the examinations are conducted without disclosing names. The Examiners have no means of knowing which students come from the different institutions.

6201. But, at any rate, there is a great advantage in a student being examined by his own teacher. Though the Examiner may not know the name of the writer of a paper, of course he gives great weight to the way a subject is treated by a student of his own class?—Well, in London we have not had that difficulty forced upon us, and have not provided any means of meeting it. The London examination papers are uniformly compared by two Examiners in each subject, and the results for the degree are arrived at by a meeting of the Examiners in the several subjects.

6202. You would not be averse to Colleges conducting their own examinations, with the aid of external Examiners?—I should not object to that.

6203. Has the London University contemplated that?—There is a provision for it in the statutes, but it has not hitherto been adopted.

6204. Do you think it would be desirable for the Colleges to conduct all the University examinations, and not only those of lower type?—That I should object to. I think the degree examinations should be carried on by the University, and in the University, and, as far as possible, be impartial between the Colleges.

6205. You are in favour of competition between the Colleges?—I am.

6206. Would you be opposed to a system of allowing the Colleges to conduct their degree examinations in presence of a delegate from the University, who would see that the examinations were uniform?—It might be possible to do that; but my opinion is that the University should be supreme in the degree examinations, and that the examinations should, as far as possible, be identical. I know a contrary view is held by some persons; but I do not go farther in that contrary view than the Intermediate examinations.

6207. To what extent do the Boards of Studies dictate the courses to the separate Colleges—I think I understand, from you, that the representatives of the faculties make recommendations to the central body with reference to the particular courses in which they are interested?—Yes.

6208. And, as a matter of practice, are these recommendations generally sanctioned by the central body?—Their recommendations pass through the Academic Council.

6209. Which is composed of Professors?—Yes, which is composed of Professors, and which, therefore, coordinates the several subjects; but, subject to that, hitherto the Senate has, on the whole, accepted the recommendations of the Academic Council.

6210. There is not likely to be any difference of opinion, as far as we understand, according to the constitution of the Senate of the London University, on account of the character of the recommendations, because they are really, as it were, recommendations made by their own body?—Yes, that is so; and the Senate has shown its confidence hitherto by adopting their recommendations.

6211. But quite a different result might come about if the teachers of the different Colleges were not represented on the Senate?—I think that would be inevitable; and I think it is a very strong reason for leaving the teachers some representation on the Senate.

6212. We know, as practical men, that when there are experts sitting on a body like the Senate, with other Senators who have no practical knowledge of the work, that the body will almost inevitably take the recommendations of the experts?—Yes; and, therefore, on the Senate so formed the Professors have, on the whole, exercised a considerable influence on the curricula, but it is the view of the Professors, taken as a whole, as distinguished from the word of a particular Professor.

6213. I quite understand. You have expressed a very strong opinion that Technical Colleges should be very closely linked with the University, and I quite see that in London—the extent of London is so immense—there are no practical objections, so far as I can see, to these Colleges—these Technical Colleges becoming constituent Colleges of a University, in order to be able, in addition to their technical work, to give instruction in the Arts course, or portions of the Arts course, in those Colleges. You would think that of importance?—Yes.

6214. But might it not be the case in a city like Dublin, which is so much smaller than London, that there would be practical objections to duplicating the teaching of Modern Science by having a Technical College connected with the University, and also technical teaching in the University. Would you think it would be sufficient if the connection with the Technical College should be of this kind: that the students of the University might attend the Technical College and have their lectures recognised by the central body, even though the Technical College is not a constituent College of the University?—I do not think that that arrangement ought to be applied unless what we are now calling a Technical College was an institution which gave a large amount of non-University work. That is an arrangement which I think desirable for the London Polytechnics, because nine-tenths of their work is below University standard. But, assuming that we have a Technical College, the whole working of which was above Matriculation standard, I think it would have every claim to be included in the University in the same sense that an Arts institution would have.

6215. But assuming, as might be the case in Dublin—in fact, as is the case there at the present time—where we have two Universities, besides the Royal College of Science, might not the College of Science be loosely connected with both Universities, and yet not be a constituent College of either?—Yes; I agree. I think this view of recognising teachers is an alternative to admitting the institution as an integral part of the University. The teachers might be recognised—and the teachers in an institution might be recognised by more than one University.

6216. Of course, it would save expense in the teaching of Applied Science, if this work might be done in the College of Science?—Yes.

6217. And in that case the Universities would be saved the expense of setting up laboratories?—Yes. That would be, in my view, not only feasible, but, *prima facie*, desirable. It would be possible even to secure better Science instruction for the available money.

6218. Of course, then it would not be necessary for the College of Science to carry on instruction in Arts, Modern Languages, and so on?—No.

6219. With regard to the next point, I should be glad to know at what age students enter the Polytechnics?—The usual age is about seventeen. There is no very rigid limit; but the great bulk of the students in the Polytechnics are between seventeen and twenty-five.

6220. And before they go to the Polytechnic they have, many of them, passed through evening continuation schools under the Department of Education?—Unfortunately, hitherto it is only a small proportion of the evening continuation schools in London that have been conspicuously successful in attracting boys and girls after leaving the elementary schools. As a matter of fact, the recent great development to which I have already referred, has been very largely among persons over eighteen years of age, and, therefore, parallel with the instruction in the Polytechnics.

6221. I suppose the instruction is of a lower character in the evening continuation schools—it is not a mere duplication of work done in the day time?—There have been complaints of duplication, but a large proportion of the work is rather parallel in different subjects than actual duplication.

6222. Yes; I was anxious to know what kind of a ladder you set up, by which the student could climb from the preliminary school to the University. I was anxious to know the standard of leaving work of the scholars in the schools who went on to evening continuation schools, and then went on to the Polytechnics, and from which you could take cases showing ability to go on to a University degree?—That is the provision made. The evening continuation school offers proper instruction for boys and girls on leaving school, and we are endeavouring, as far as possible, to make such classes lead up to a University.

6223. Do you offer prizes or Bursaries?—We offer 100 Exhibitions of £5 a year to persons under seventeen years of age who have been two years in an evening continuation school.

6224. Have you been able to follow that up?—We have not been able hitherto to award all these Exhibitions, as comparatively few students enter the Continuation Schools under the School Board at a sufficiently low age, but we hope it will be followed up.

6225. Have boys who won the Bursaries turned out well?—Well, having been good diligent students of the Polytechnics, to which they proceeded.

6226. Do any of them go to Cambridge. I remember hearing of a Senior Wrangler who had commenced at elementary schools in London?—Yes; we have for that purpose, another ladder. We have the County Scholarship system, on which we spend something like £40,000 a year for selecting the ablest children under thirteen from the elementary schools, providing for them education in the Secondary Schools, and then again carrying on the best of them to University Education in the London or other English Universities, or even abroad. And I should like to say, for instance, that every term we have four or five University Scholarships at Oxford or Cambridge, won by our Intermediate scholars, showing that the ladder to which I have referred really works for University Education. For instance, I have before me a small paragraph, taken from *The Times* of Saturday, and which states that no fewer than four Scholarships at

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Trinity College, Cambridge, and Emmanuel College, Cambridge, have just been won by young men holding London County Council Scholarships of this nature.

6227. Does the ladder pass in this way from the Primary Schools—how does it pass to the higher Elementary School—I do not understand the relationship between the higher Elementary School and the Primary School?—That raises a highly controversial subject. Perhaps the best thing to say would be this: the higher Elementary School, so far as it is developed in London, to some extent competes with the second grade Secondary Schools. Our Scholarships can be won by students of either schools indiscriminately: we make no distinction between them.

6228. Between lower grade Secondary and higher Elementary Schools?—Yes. We make no distinction, except that we have a limit of income which practically confines the lowest grade of Scholarships to Elementary Schools, though not absolutely.

6229. All the students who get their Scholarships from the higher Elementary Schools, entered the higher grade Secondary Schools without passing through the lower grade Secondary Schools?—Yes; we leave an absolutely free choice to the parent, and the parent of a scholar may select any school he chooses from the whole list, which includes all schools, from the highest first grade Secondary down to, and including, the higher Elementary Schools.

6230. With regard to external students of the London University, I understand that you intend to continue the examination?—Yes.

6231. That is under a different Board of Studies?—They are under the same Senate and the same Board of Studies, but advised by a separate council—the council for external students.

6232. And I believe the Senate are making an attempt to preserve a uniform standard in the examination between external and internal students?—Yes; that is required by statute.

6233. Have you carried out any examinations for internal students yet?—No; we have not. There have been no examinations for internal students yet.

6234. It would be unfair, perhaps, to ask you your opinion as to the advisability of this proposal?—I see no reason to think that it is not quite practicable. I confess I anticipate that the examinations will probably be identical: not merely equivalent, but probably—my own opinion is that they will be identical.

6235. But will there not be a danger, then, of the teaching institutions being starved. I know there would be that danger in Ireland. Have you thought whether, if the same facilities are given to internal and external students, there is a likelihood of the teaching institutions being starved?—I do not think so, in London. We think the opportunities of obtaining instruction by means of evening classes, and at very low fees, which we now provide, will attract the bulk of those who, in London, have hitherto been external students.

6236. But the external students will pay lower fees?—The external student will pay only the examination fee, in addition to whatever fees he pays for attending classes.

6237. In Trinity College, Dublin, where external students are recognised, they pay the same fees as if they attended lectures—sixteen guineas a year. Would you be in favour, in order to encourage the teaching institutions, of a regulation of that kind?—No; because that would mean to put a very heavy tax upon the present external students. I should like to point out what the value of the external degree is, particularly to the lonely student all over England who cannot obtain access to teaching. It is of great advantage to him that he should have the same goal to work for, and the same facilities for obtaining, and should be quite as free to get his University degree as the internal student is to obtain it.

6238. You are assuming that a University College is not within reach of such a student. Have you found that the lonely students of that type, who find it impossible to obtain collegiate teaching, are a very numerous class?—Yes.

6239. Do you think that that class will become a larger or a smaller class?—I am afraid that they will continue to be a very numerous class, because the financial difficulty comes in. You have the village schoolmaster, who aspires to the attainment of a degree. Well, he cannot go to a University fifty miles away, because that would involve his giving up his teaching work.

6240. I quite see that; but don't you think that it might be giving too much weight to the interests of the solitary student, if on his account we, in Ireland, kept up a system of the examination of external students which would really have the effect of starving the teaching institutions, as has been found to be the case in Ireland?—I think some solution of the difficulty might be found, provided that, for instance, instruction were given in the evening, and at low fees.

6241. And we will say, for the sake of the solitary schoolmaster, by holding a summer course?—Provided, for instance, in Dublin there were ample provisions for evening instruction at low fees, I see no reason why there should be any external students living in Dublin. I should hope there would be no external students of the London University living in London, because they would be always able to attend classes of recognised teachers at low fees at convenient hours. But that would never apply to persons not living in a town where such teaching is provided.

6242. Our experience in Ireland, and even in Belfast, where there is an excellent College, where the teaching fees are not high, is that students prefer to go to certain grinding establishments, where the fees are also not high. and where the work of cramming can be done in about a fourth of the time that would be spent at the College?—We have that difficulty in London, and to a great extent, too; but we believe that we can cope with that by some alteration in the character of the examinations. For instance, in Latin and Greek we have decided not to have any set books, and it is believed that that will greatly disconcert the grinder.

6243. I quite agree with you. I have no doubt you are right in the assumption that, by altering the style of the examination, to a considerable extent one can turn the flank of the crammer?—I confess I have not seen my way to take any more drastic measures against the crammer, because I am concerned for the lonely student.

6244. Professor DICKEY.—Have you any oral examination in the London University?—We have not hitherto had such examinations in connection with any of the honours degrees but the doctorate. The examiners for the doctorate may always require the candidate coming before them—they may put him through any examination, oral or otherwise, that they see fit. That only applies to the doctorate; and, in a sense, the practical examinations in Science may be considered oral examinations.

6245. In Classics?—In Classics there have been no oral examinations and I think it is not contemplated that there should be any except always for the higher degree.

6246. Of course, where you have no oral examinations you get rid of the difficulty, to a certain extent, of teachers being also examiners?—Yes, and that is the reason for dispensing with oral examinations so far as they can be dispensed with.

6247. You have a good many rewards open to students in connection with the London University for all examinations, I presume?—Do you mean prizes?

6248. Yes, and Scholarships?—No, there has not been much gained in that way in London University examinations. There are a few small prizes at our examinations, but they have not, I think, played any important part, because the numbers have been so very large, and our feeling in the Senate is in favour of abolishing these small prizes and Scholarships at the lower examinations, such as the Matriculation and the Intermediate, in favour of granting sufficient Scholarships either to take the candidate right through the University course, or by granting valuable Scholarships at the degree for the purpose of encouraging research or specialisation. We believe that the smaller prizes are of comparatively little use.

6249. Of course, that removes another difficulty where the Colleges are competing against each other for valuable awards in the University?—Yes; I should not desire to encourage that competition in any way.

6250. You have no Fellowships provided in the London University such as are in the Royal University, have you?—No, we have no funds for that at present.

6251. Have the constituent Colleges teaching Fellows?—Practically not. At the London School of Economics we have one—a Fellowship tenable for two years. The Royal Exhibition Commissioners give, practically, one Research Scholarship to each University College each year, and there are a few others, but, practically, the teaching Fellow does not exist in London.

6252. You said you did not experience any difficulty in providing for Colleges, geographically remote, in

the London University, and you referred to the Victoria University as another illustration of that. Are those two Universities not of different types?—Yes, they are of different types, but I would not force the analogy too far. The fact remains that we are able successfully to include Colleges outside London.

6253. But the London University is not a College, but a federation of Colleges?—I think it is something more than that. It is more of a united body than a mere federation.

6254. Where there is a federation of Colleges, and each recognised practically to the same extent, would that create a difficulty?—There is a difficulty, and, probably, other difficulties might arise, but of which I have not experience.

6255. Of course, you are aware that Victoria University is on the point of some changes and developments in the direction of separation?—Yes, I am not unmindful of the fact that local patriotism will sometimes do a great deal more for a local University than for a mere College.

6256. Under certain circumstances, you would not object to the multiplication of Universities?—No, I would not. On the contrary, I think it would be very desirable that in England there should be three or four more Universities than exist at present. I think that local Universities are very useful, where they can be strongly maintained, and, probably, more useful than constituent Colleges in a federal University; but there are cases in which a locality could not maintain anything worthy to be called a University, and in that case it had better, perhaps, form a part of a federal body.

6257. You referred to a great many subjects as being provided for in the London University, but I do not think you referred to Architecture. Has any provision been made for the teaching in Architecture?—Yes, provision has been made by the formation of a Board of Studies for the subject of Architecture, and there is a little instruction in Architecture in some of the constituent Colleges, but the University itself has not at present made any provision for an architectural degree, or for a curriculum in Architecture. There are three or four recognised teachers of Architecture.

6258. But the demand has not arisen for a degree in Architecture?—No; I think it is a very great pity that there is not any definitely organised instruction in Architecture of a University type. What I have seen in America makes me strongly believe that professional subjects of that character, as part of a University course would be most valuable, but in England, unfortunately in Architecture, as in some other professions, we still retain the old status of pupil and master, which, I think, is not so good as more definitely-organised University instruction.

6259. I do not know whether you could give us detailed information or general information about the equipment necessary for a good Technical College?—I think that probably Dr. Garnett could give you so much more valuable information on that point.

6260. Professor LORRAIN SMITH.—You spoke of sufficiently low fees, but you did not specify a scale of fees which you would regard as sufficiently low. My own impression is that for an evening student in a subject like Arts or Economics, a fee of £5 a year should give him a full University course. A Science student, I think we should provide for a fee of £15 a year for the University course.

6261. In all the subjects?—In all the subjects required for the Physical Science degree, and I should think that the other faculties ought to conform to those two types.

W. GARNETT, Esq., D.C.L., examined.

6262. Mr. Justice MADDEN.—Dr. Garnett, you hold the office of Secretary and Educational Adviser of the Technical Education Board of the London County Council?—Yes.

6263. And I understand that you were formerly Principal of the Durham College of Science at Newcastle-upon-Tyne?—I was, for nine years.

6264. And that you were Examiner in Physics and other subjects in the University of London, and also at the Victoria University?—Yes, I was, and in a few others.

6265. I shall commence by asking you some questions arising out of your experience as an examiner in these Universities, and I begin with the Victoria University, because the system of the University of London has not, up to the present time, as I understand, been absolutely fixed. The Victoria University has three affiliated teaching Colleges; is not that so?—Yes, it has three federated Colleges.

6266. Three federated teaching Colleges?—Yes.

6267. I think it is not necessary to obtain from you specifically information about those three Colleges, because we have already had the advantage of the evidence of a witness who, I think, put us fully into possession of the facts concerning the constitution of the University, and of its relation to the affiliated Colleges. But with reference to the mode of conducting the examinations, I understand that there is a single examination conducted in Manchester for University purposes, and that there are not separate examinations in the Colleges?—That is the weak point in the examination system of the University. When I was appointed, I was appointed external Examiner in Physics. There was associated with me an internal Examiner, who was a teacher. Now, that internal Examiner was a teacher in only *one* of the three Colleges, and his presence as internal Examiner was intended to secure that my questions as external Examiner came within the syllabus of the work of the Victoria University. There was not anyone, however, to point out anything on behalf of the teachers of the other Colleges, which were geographically remote, consequently the Examiner could not discharge his functions with equal fairness in connection with all those three Colleges. And, therefore, a better course would have been adopted if, as regards one-half of the examination paper the external Examiner had set it entirely in questions relating to the elementary principles which every student must understand, if he is to really know anything about his subject, and where there was room for differentiation between the several Colleges; that there should have been associated with the external Examiner a teacher from each College, so that, where there was room for differentiation, the questions might have been different for the three Colleges.

6268. The question is not one of conscious unfairness on the part of the Examiner, but it is founded upon a necessary result; namely, that a teacher, when he comes to examine in a subject upon which he has lectured, cannot help setting the paper in such a way as to afford, in a certain degree, an advantage to his pupils?—There is no question of conscious unfairness. The internal Examiner of one among these Colleges, say, Liverpool, would naturally conduct his examination on the lines of his teaching, without any intention to be unfair, and when the Manchester teacher was internal Examiner, he would unconsciously lead the candidates in the direction of his teaching, and so on. And if the influence of the internal examiner and teacher in the examination is anything at all, then it is quite clear to my mind that that Examiner cannot discharge his functions with equal fairness to the students, whom he himself has taught, or to students who have been taught by his assistants, and with whose idiosyncracies and the details of whose work he is thoroughly acquainted, and also to those students who attended a College 100 miles away.

6269. So far you have been dealing with the University examinations for the degrees, for which these Colleges are schools. The same difficulty would not arise if the affiliated Colleges conducted their own examinations?—They would probably be conducted by the Professors of the Colleges, with the assistance of one or more external Examiners, so as to obtain uniformity between the affiliated Colleges. In the University of Durham, the College of Science at Newcastle-upon-Tyne, of which I was Principal, was the Science College of the University, and there was a system there of appointing external Examiners in every subject, and of associating them with the internal teachers, and the examinations for the students in the College of Science at Newcastle-upon-Tyne were entirely distinct from the examinations of students in the Colleges at Durham.

6270. Did they lead up to the same degree?—They led up in Newcastle to the degrees in Science, &c, while in Durham they led up to degrees in Arts and Theology. But, even if they had led to the same degree, that system would have been a proper system for conducting examinations upon.

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6271. You filled the office of Principal of the Durham College of Science, and I should like to ask you one or two questions with regard to it. I believe this affiliated College might be described as the College of Science in connection with the University of Durham, utilised by the University for the purposes of Science teaching?—The College of Science is a misleading title, due partly to its history. It was developed very largely by the mining engineers of the district, and then it came to be recognised as one of the University Colleges. After that, while I was Principal, the College developed a Faculty of Art, Engineering, Literature, and Science—in fact, a College in which all the subjects, except Divinity, which are ordinarily found in University Colleges, are taught. Therefore, it would be well to remember that the word "Science" connotes nothing now with reference to the College of Newcastle.

6272. I was aware of that; but it has an important scientific side, has it not?—Yes, it has an important scientific side.

6273. And that scientific side has been recognised by the University of Durham?—Yes, and the Literature side has been recognised under the new charter, and degrees are granted in literature to students of the Newcastle College at the Durham University.

6274. And as to Arts?—They confine the Arts degree to the Durham students. In fact, it was a desire that all the work of Theological students, in connection with Arts and Divinity, should be done under the shadow of the Cathedral of Durham.

6275. For the purpose of this branch of our inquiry, the important circumstance is that the Science teaching at the Durham College of Science at Newcastle-upon-Tyne is recognised by the University of Durham?—It is the Science Faculty of the University of Durham.

6276. The College, as you have expressed it, constitutes the Science Faculty of the University of Durham?—That is so. That is the fact that I desire to bring out: that it constitutes the Science Faculty of the University of Durham.

6277. Now as to the governing body of the University of Durham—can they exercise any, and what, control over the College of Science?—The governing body of the University of Durham, that is to say, the Senate, appoints six members of the Council of the College of Science. That Council consists of persons representative of the Senate of the University, appointed by the Senate. It also contains representatives of certain institutions in Newcastle itself: institutions that were connected with the founding of the College, and with the original capital by which the College was founded. It also contains two representatives of the County Council of Durham; two representatives of the County Council of Northumberland, four representatives of the Corporation, of the County Borough of Newcastle-upon-Tyne, one nominated by the North-east Coast Institution of engineers and shipbuilders, and one by the North of England Institute of mining and mechanical engineers. So that in this way the local authorities for technical instruction, and the professional and scientific men closely in touch with the industries of the north-east coast, and with the University itself, are all brought directly upon this Council; and though there are among them no teachers as such in the College, the principal teachers have consultative seats upon the governing body.

6278. Is the College of Science fairly well equipped with the necessary apparatus for the teaching of Practical Science?—Yes; there have been some £60,000 or £70,000 spent there, apart from the purchase of the site, while I was principal, and in addition to that there was a quantity of apparatus brought in from the old place. And since I have left, during the last ten years, there have been considerable additions to the appliances. There is a set of quadruple expansion experimental engines, designed for experimental purposes, and given by twenty-eight different firms of engineers on the north-east coast, which contributed separate portions of those engines. Those engines are valued at £3,000. And there is a marine boiler, and a 100-ton testing machine, that cost £1,000, and a quantity of apparatus of that kind in the laboratory; and I think that the electrical engineering, the physical, and the chemical departments, are correspondingly well equipped.

6279. The University of Durham derives this advantage from its recognition of the College of Science as its Faculty of Science, in that it is unnecessary to reduplicate that expensive apparatus?—Yes, that is so; and its position. This is calculated to aid its work in teaching Science. It is in a much better place, where it can be used on the north-east coast, for the industries of the North, than if it were situated in Durham.

6280. Sufficiently for the means of instituting a comparison, you know generally, I presume, the population of Dublin, the population of Ireland, and its condition for the purposes of a College of Science or Technical School. A College of Science for a country like Ireland would need, I presume, a laboratory and apparatus on a very extensive scale?—I imagine you could very well expend £100,000 or £150,000 on a site and buildings, and £50,000 or £60,000 in equipping such a College; but those are figures suggested at random.

6281. We cannot expect to have more than a general estimate?—I should be glad to provide for the Appendix some account of the cost of such a College, if that would be acceptable to the Commission.

6282. That would be extremely valuable—if you would kindly give us, from your experience, a paper which we might print in our Appendix, and study for the purposes of our report, stating substantially what would be required for the purpose, which I have indicated in very general terms, and also an approximate estimate of the annual expenditure that would be required for maintaining such an institution, and keeping it up to date?*—Yes; and confining myself mainly to Chemistry, Electricity, Mechanical Engineering, and certain branches of Civil Engineering, as regards scientific equipment, I am leaving out the literary side.

6283. You have heard the evidence given by Mr. Webb on the subject of Technical Education in connection with the University of London. I do not take you over the same ground, but if you have any additional remarks to make, or suggest any modification of the views that Mr. Webb has expressed, we shall be very happy to hear you?—I shall be glad to answer any definite question that may be put to me, but I do not think that I can in any way say anything to modify Mr. Webb's views.

6284. Speaking generally, you adopt the views laid before us by Mr. Webb?—Yes. Mr. Webb, as a member of the Senate of the London University, is much more definitely conversant with the internal working of the University than I am. There are one or two points to which Mr. Webb referred, upon which I hold particular views, and which I shall be glad to express, if you wish.

6285. Certainly?—I would say, with regard to the examinations of the University of London, what Mr. Webb, I think, implied, though he did not explicitly state it, that the examination machinery for the new University has really not been developed, and many statements respecting the actual conduct of the examinations made by Mr. Webb, are strictly accurate as to the present conduct of the examinations; but they really relate to the old machinery of the old examination body.—(Mr. *Webb*).—Quite so.

6286. So I understood from Mr. Webb's evidence, and that is the reason why, in commencing your examination, I directed attention to your experience in the Victoria University. The great changes in the University of London will necessarily involve a reconsideration of the entire examination scheme, and I would like to ask you one other question—are you in favour of continuing the functions of the University of London as a purely examining, as distinct from a teaching, University?—(Dr. *Garnett*).—I say it is a most essential thing to have the University of London as a purely examining body. I did strongly hold that we would find extreme difficulty in uniting the functions of an Imperial and examining body with the functions of a local teaching body. For a long time, whatever influence I had I used against the attempt to make a single University combine those functions. When, however, two Royal Commissions reported in succession on the opposite side I, of course, put my private opinions away, and said, "Now we must make the best we can of the University as recommended by these Royal Commissions." But I think it is most essential that there should continue to exist for the whole British Empire such an examining body as the London University was, and we hope, in one department, will continue to be. You asked me if I wished to say anything about Mr. Webb's evidence, in other respects; and there was one point that Mr. Webb referred to on which I have some little personal experience, namely, the desirability of allowing Professors and teachers in technical subjects to undertake private consulting work. I entirely agree with Mr. Webb that, as a rule, it is necessary to put great restrictions upon that outside consulting practice. But I have felt, in my own teaching experience—as all other technical teachers have felt—the great advantage in dealing with a lot of young

*See page 317.

apprentices, men engaged every day in carrying out industrial operations—the great advantage of being in touch with them, by also having to keep pace with the commercial progress of their particular industry, and by knowing as much about what is going on in it as they themselves know; and it is almost impossible to do that unless the teacher does occasionally go outside his teaching institution and undertake a certain limited amount of consulting work. He is ignored by manufacturers, unless he is known in this consultative capacity. But, having come to that conclusion, then, I think, first of all, no teacher should undertake such work without the full knowledge of the governing body with respect to the conditions under which he undertakes it; and, secondly, the work he undertakes should be strictly confined to the consultative side, and he should never be allowed to undertake the responsible executive carrying out of any particular piece of work. For example, when I was teaching Engineering, and particularly Electrical Engineering, it was in every respect conducive to the practical and intelligent teaching of my students that I was allowed to undertake a set of experimental tests for the Corporation of a town, or some public body of that kind. Perhaps I would undertake the testing of a form of new boiler, or of an electric generator, or I would test the varieties of steam coal available in a particular district, so as to recommend what was the most economical product to use. And I say that information so obtained would be most valuable in dealing with my own students, but without making myself responsible for the actual carrying out of a large undertaking, and the expenditure of a large sum of public money. Personal responsibility in the carrying out of undertakings is, in my opinion, inconsistent with the proper carrying out of the functions of a Professor to his students. And with regard to the teacher undertaking the responsibility with regard to a large amount of public money, that responsibility should, I believe, only be undertaken by a man who is practically carrying on, and living by, his profession. I would, therefore, urge that all teachers should be paid such salaries as should provide them with adequate living, and it should never be necessary for them to undertake private consulting work, or any other kind of professional work, for the sake of their livelihood. The former might be permitted with the full knowledge of the governing body, because the undertaking of a certain amount of consulting work would not necessarily imply the spending of money and the actual carrying out of the works.

6287. Most Rev. Dr. HEALY.—I understand that you have had very considerable experience as an Examiner to the federated University of Victoria. From your experience would you think it feasible for those associated Colleges to have examinations of their own for the purposes of the Pass degree, with, of course, an outside Examiner to assist the local Examiners?—As regards the more elementary parts of the examination I think the examinations should be in common for all the students of the University; but when we come to the more advanced subjects I think it is very important that play should be given to the individual characteristics of the teachers, and that as the examinations become more advanced, or more highly specialised, teachers should take a greater part in preparing the syllabus which is submitted to the external Examiner, and also in preparing some of the questions. Therefore, for the final degrees I would have a separate examination for each of the schools of the University—in fact, for each set of students who had been trained by a different Professor; but for the more elementary and more fundamental principles, I would have the work quite common; for all students ought to know something of the principles of Science, and that knowledge should be common. But in the more advanced branches of University work the students should be encouraged to learn everything of some more narrowed branch of study, and that is the work of the future, to my mind, of a teaching University, as distinct from a purely examining University. The possibility of giving play to the individual teacher without handicapping his students in their examination should be aimed at. Now, if you have a common examination for all the students, that examination, to be fair, must be upon such broad lines that the students who have been cramming, the students of every school of the University, and the students who have read quite privately, should all have an equal chance. Therefore, no Professor can afford, and the students cannot afford to allow the Professor, to do his best work in his own subject. That difficulty does not arise with the Matriculation students, and only very rarely with the Intermediate; but it does arise with the B.Sc. and the Doctorial examinations, and I think that the examinations should be specialised in each instance. There must be an external Examiner always responsible for all the students in each instance.

6288. I was contemplating the case of intern students of a constituent College of a teaching University, and what I wished to know was, would you not consider that it would be quite competent for the authorities of these constituent Colleges, with a few external Examiners, to give Pass degrees to their own students, and to conduct all the examinations leading up to the degree by examinations of their own students?—That would be equivalent to making each College a separate University; and that the University would not like to do.

6289. I should wish to know how far that is possible?—I think that the Senate must be—that the University must be responsible for the conditions under which degrees are given to all the students, and I do not think we could allow the constituent Colleges to be competing with one another in the direction of lowering the standards in order to attract students, by one giving the degree at a lower standard than another.

6290. I meant simply for Pass degrees?—For Pass degrees it is much more important, because the element of competition comes in so much in the Honour degrees. We have found that very much in connection with the Medical Faculty. It is complained that medical students go to Glasgow, or Edinburgh, or Durham, for their degrees, on account of the increased facilities existing in those Universities for obtaining the qualifications, thus drawing the London students to Edinburgh, Glasgow, or Durham, as the case may be.

6291. Would you not consider that the Senate of a University, by having the appointment of the external Examiners, would retain sufficient control over the standard of the examinations as to make them practically on the same level in the constituent institutions—by retaining the appointment of the external Examiners?—Yes, by retaining the appointment of the external Examiners, and by allowing the external Examiners, as in the Victoria University, to be the sole authority as to whether the candidate should be allowed to pass. The Senate can then sufficiently control the standard of the examinations, and the independent action of the teacher in the direction that I have indicated, especially in the more advanced examinations, enables that liberty to be given to each school which is the essential feature of a teaching University.

6292. In so far as this is a question with regard to the Honour students, and not of collegiate competition, would you regard oral examination as essential in cases of that kind?—I would always require, in the case of Honour candidates in Science, and, I think I might say, Mathematics, and certainly in Applied Mathematics, that the Examiner should, in the conduct of his examination of any student, have an opportunity orally of sifting the foundations of his knowledge, in a way that is absolutely impossible by paper examinations only. I may add that I have come across students who, in a written examination, would have deceived me, not knowing their subject thoroughly; but when I had an opportunity orally of probing them, all the cram disappeared, and then the difference in the foundations upon which the knowledge rested, changed my view with regard to them.

6293. For Honour examinations you think it desirable that the same papers should be set for the students of all the constituent Colleges?—No; I think that in the case of the Honour students we should allow a great deal of specialisation.

6294. And you would not have them examined on the same paper?—No, I would not have them examined on the same paper; I would have some questions in common: questions which relate to the fundamental principles which every student who knew anything of the subject should know; and then I would have questions which would differ in each of the different schools, and in which the individual teacher would have a considerable influence.

6295. How would you be able to award, in that case, the University honours and the collegiate honours?—I think that that is a question of minor importance as compared with the teaching of the school. I would rather give the prizes in quite separate examinations.

6296. Supposing there was a question of a valuable Scholarship of a collegiate character to be competed for, would you not think it desirable that some common standard should be adopted for testing the merits of its

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students?—Certainly; but a degree is not a collegiate Scholarship; and I think I should prefer to have a separate examination for that, rather than award it upon a degree examination. In the University of Cambridge, as far as I know, there were no prizes awarded upon their degree examinations, excepting the honour of their degree.

6297. Are they not awarded in the London University?—Yes; I think, to some extent, the influence of those small Scholarships has been to attract Oxford and Cambridge men to go in for those examinations for the sake of the Scholarships, and many of them never trouble to go in for their degrees, and a *bona fide* London student who wanted a Scholarship has been robbed of it in that way. In Cambridge, the chief University rewards of a financial character, or the University Prizes, such as the Chancellor's medals, and so on, are given on separate examinations, so that the Scholarships and prizes do not interfere with the degree examinations.

6298. Would you think, for the purpose of promoting the interests of higher education, it would bring the students of the different Colleges into healthy rivalry if you allowed them to compete in a common examination?—I do not think it would.

6299. You do not think that that would be desirable?—I do not think it desirable to bring them into rivalry upon a common examination. The Examiners would thus report on the performances of the different Colleges upon a common examination; but when one-half of the papers is common for the University in the Bachelor examination, and the other half is special to the different Colleges, the external Examiner is able to hold the balance.

6300. Would it not be difficult to hold the balance where examinations were not conducted on the same standard throughout?—I do not think so.

6301. Professor LORRAIN SMITH.—With reference to the consultative work, in which you said you thought a teacher might engage—the effect of your permitting teachers to have some connection with consultative work would be, I presume, to give vitality to the teaching?—Yes; a teacher commands the confidence and sympathy of a number of practical students very much more than if he remains outside the arena of practical work. The most interesting lectures I gave to students, who included a number of young apprentices and draughtsmen who were engaged in Electrical Engineering, were those regarding experimental work I had in hand, and which had a direct bearing on commercial development.

6302. The necessity of this is put before us, you think, in order to prevent that aloofness from practical work which is likely to be the case on the part of a teacher engaged in a purely academic institution. Now the question which I wish to ask as a result of that is, can you suggest another way of securing that effect?—As regards the aloofness from practical work, in consequence of the connection with the University Senate, I do not see the necessity for that at all. The principles which I have endeavoured to suggest as a guide to the work of a University institution I should apply to any other public teaching institution, that the Professors of the institutions who are giving their whole time should be of the kind that I have indicated; but that there should be brought into those institutions for special courses of lectures and so on, if they could be secured, men who are quite independent of the College, except for the particular course of instruction on which they are employed, who would come in and give a course of, say, twenty lectures or demonstrations, or a smaller course, upon the matters in which they are experts. I would do that. I would introduce on the governing bodies of the Colleges the representatives of trades and societies, and in that way touch could be kept up.

6303. What I wished to know was how you would keep in touch with practical work the expert teacher, so as to give vitality to his teaching?—I do not think you can keep him in touch with practical and experimental work, unless you allow him, to a limited extent, to undertake work in his laboratory or elsewhere, where it is of a consultative character. But I see no objection at all to, first of all, requiring that his governing body should give their special permission in every case to his accepting a limited amount of consultative work; and I see no reason to restrict that permission to work in their own time, if the different bodies think it will give the teacher in return sufficient help in his teaching.

6304. Am I right in thinking that you regard that as necessary?—Yes; that I regard it as necessary, in some cases, for the main technical teaching in a University institution.

6305. Then one other point. You spoke of an Imperial examining body—of the London University being an Imperial examining body. The problem—the question is put before us in this form: that the London University is a sufficient institution of that type for the empire—for the three kingdoms, anyhow—and that it would be unnecessary, in Ireland, to have an institution of a similar type; that, provided we had teaching Universities we need not provide a merely examining University corresponding to the examining side of the London University. What is your opinion with regard to that view?—I think it is quite enough to have one University which undertakes the examination of all British subjects.

6306. And, as regards teachers at examinations, I think I am not mis-stating the result of your examination when I say that the more advanced the teaching is the more intimate should be the connection between the teacher and the examination which tests his student?—I think so; and I would go on in that direction until, presently, I arrived at the award of a degree in Science upon a piece of research work which has been carried out by the student, with the guidance of the teacher, and which is submitted to his Examiner.

6307. And with the setting of which the Examiner has had nothing to do?—He asks no questions, except at the *viva voce* examination, in order to ascertain how far the student has understood the meaning of what he has done, and how far the teacher has helped the student in carrying it out.

6308. Beyond that you say that the thesis which has been prepared on some piece of Experimental Science for the degree is the absolute and direct work of the student under the teacher's guidance, and that the Examiner had had nothing to do with it?—Yes, quite so.

6309. You would regard it as desirable, in a University with several affiliated institutions, that they should have no inter-collegiate competition for prizes?—I do not see any objection to inter-collegiate competition for prizes and scholarships, and so on, provided that they are kept quite apart from the degree examinations.

6310. Dr. STARKIE.—With regard to having inter-collegiate examinations, would you recognise the difference between subjects as constituting a considerable difficulty in certain cases; in such subjects, for example, as History, Metaphysics, and Practical Science the individuality of the teacher is much more prominent. You have mentioned the examinations for University Scholarships in Cambridge. In Cambridge, I suppose, you are aware that those examinations are only in Greek and Latin?—There is the Sheepshanks Scholarship in Astronomy.

6311. With regard to those University examinations at Oxford and Cambridge, if a student wins a Scholarship he has become a student of a College?—Yes.

6312. But the older Scholarships are for proficiency in Greek and Latin, and for them there were no prescribed courses; they were general examinations in the knowledge of the languages?—There were also the Smith Prize, the most coveted prize by mathematicians in the University.

6313. The examination for which has been abolished, has it not?—I believe that the special examination has been abolished; and since then the mathematical tripos has been changed. Now, if I remember rightly, the arrangement of the mathematical tripos has been altered by the second part being separate, and quite distinct from the first part; and I think it has been found possible to award the Smith Prizes on essays.

6314. The point I was trying to make is this: do you think that if the Colleges were loosely affiliated in the way some of us suggest, it might be possible to keep up competition in certain subjects, say, the Ancient Languages, upon which the students could be examined in an unprescribed course in such a way that students of any particular College could not have any advantage?—In such a case the objections to that inter-competition would not be so great as in such subjects as History and Metaphysics. I maintain the position that, even if you take the case of Greek and Latin, then in such a case I can understand that the individuality of the teacher will take the students into bye-paths of study which are very important, especially in the more advanced studies, and especially in the keeping up of philological and antiquarian research, and so on; and in a University which has the cause of highest education at heart those

bye-paths of study should be encouraged which are not consistent with a common examination.

6315. That is so, to a certain extent; but it is true to say, is it not, that it is less the case in the Ancient Languages than in the other subjects you have mentioned?—Probably that is so.

6316. But for students under twenty-one years of age such studies are more important than those special subjects?—Yes, of course.

6317. Inter-competition would be much less objectionable in such subjects?—It would be much less objectionable than in the case of Science. Take Organic Chemistry. I have forgotten it now; but the Science, the study of Organic Chemistry has developed to such an extent that no man can master it in its entirety. Teachers are, therefore, obliged to specialise if they want to carry their students very far into any particular branch of the subject.

6318. You think, on the whole, that it would be of advantage to the affiliated College that there should be external Examiners, who should have a controlling voice in the awards on the different subjects?—I think so.

6319. And that the students who satisfied the external Examiners should be qualified for the degree given by the University on the result of examinations conducted by their own College with the help of external Examiners?—Everything depends upon the instructions given to the external Examiner, and the extent to which students are examined by their own teachers. I think that the external Examiner should go through all the papers.

6320. And the final award should bear his signature?—Certainly. And I think that the teacher should have something to do with the setting of the questions in one part of the paper, so that that part of the paper may be actually upon the course of study which the teacher has pursued; and that the external Examiner would take that part of the paper which he, in his discretion, deems to be essential to every student, and would see that that part of the paper would be common. For the rest he would see that he approves of the course of study, and he would have the right to put any question he liked.

6321. In connection with that, should you be in favour of allowing the teachers of each College to suggest their own courses of study to the Senate, the Senate having the power to refuse to recognise them unless they fully complied with their requirements?—Certainly; that would be the proper course. That is the only way to get the best work out of the teachers.

6322. Professor RHŶS.—I was glad to hear you touch on the question of mixing up the examinations for prizes with that for degrees. I think you disapproved of that?—I think it is a pity to interfere with the University examinations, merely for the sake of making the examination one upon which prizes and Scholarships are awarded. I would prefer as a rule to have a separate examination for them, rather than spoil the degree examination.

6323. I have in my mind what the Royal University of Ireland has tried to do. There is an examination where you are supposed to have a certain standard, and every one who comes up to that standard passes, and then they have combined with that a graduation examination, and give prizes. Does that not seem to you unworkable?—I think you run the risk of spoiling the work of your teachers and spoil the examinations to a great extent. Say I have a class and I am taking them through a course of study in Applied Mechanics, in those subjects I know most about. Say that Mr. So-and-So, in another College, is doing the same thing. We can do our best work if we are left free to carry on the most advanced part of our course, subject to the control of the University, in our own way. But if I know that my students have to compete with that other man's students in an examination, I am obliged to study the idiosyncracies of that teacher, and must study the papers set for perhaps half-a-dozen years, lest, if I did not do so, my students should be placed at a disadvantage. The interests of my students demand of me that I should give them the best chance of obtaining Scholarships and prizes, and I have to abandon the work that I can do best and which will do my students the most good, and from which they would derive the most benefit in after life; and take up work that I can do indifferently, and I have to do this in order to enable my students to compete with the man in another institution. That spoils my work.

6324. That is my point; you lay stress on that?—Yes. As to research work, in connection with Professors' work, I do not know whether any of the Commissioners desire to ask me any question.

6325. Professor LORRAIN SMITH.—In connection with the individuality of teaching, I did not understand you to refer to research. I asked you if some other way of getting individuality of teaching might be suggested?—I beg your pardon if I did not appreciate what you said. I think in Science work that no man ought to be entrusted with advanced teaching and, if possible, no man should be entrusted with elementary teaching who has not been engaged in actual experimental work himself for the purposes of discovery, or setting himself some particular problem to work out, and working that out to the best of his ability. So that a certain amount of educational research work I would regard as a condition precedent to the appointing of a teacher to an important position. But I recognise that the most distinguished researchers are not necessarily the most useful or able teachers. I think there is a different attitude of mind possessed by the born enthusiastic teacher and the born enthusiastic researcher. The man who is a born researcher may be a good teacher, may be very fond of teaching, but that does not necessarily follow. He is much more likely to regard his students as a necessary evil, and to say, as has been before said: "The University would be a very nice place if there were no undergraduates, for we could then go on writing our books and making our researches without interruption; but we feel it to be a great burden to be called off from those pursuits in order to deliver lectures to pupils." The teacher who is specially devoted to research, and who considers it a more important duty to carry on his researches for the advantage of the University is, as I have said, apt to regard students as a necessary evil; while another teacher delights in his students and takes as his chief problems in research those in which his pupils have met difficulties. His chief aim is to direct the work of his pupils and with him research work is only a secondary consideration. Now, if a University can afford it, I think there should be two classes of teachers—one, the man who devotes himself mainly to research, and perhaps gives forty lectures in the year on the results of his research to post-graduate and advanced students; and the other man who is devoted to teaching, who only continues his research work chiefly in connection with those problems which present themselves to his classes, and sometimes in quite elementary classes. And I think there is a danger of going so far in recognising research, especially recent research, as a qualification for teachers, that the teachers in our University Colleges may be tempted to ignore their responsibility to their students, because they know that the Royal Society and other such bodies gauge them, not by their success as teachers, but by their success as researchers, and the greatest prizes are not given to the man that has been most successful as a teacher, but to him who has been most successful as a researcher. I do not say anything disrespectful of research; I regard it as most essential, but I think we should bear in mind that there are those two types of persons.

6326. It would be the natural result of your ideal that, say in Chemistry, there should be one Professor for teaching and one for research?—Yes; one whose qualifications were mainly as a good teacher and one whose repute rested upon his being a good researcher. If a man ceases to be a researcher and becomes a teacher only he very soon becomes antiquated, and loses touch with the progress of his subject. I think to a great extent the encouragement of research, not for the sake merely of commercial results, would go a long way to keep the teacher in touch with his students.

The Witnesses withdrew.

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Professor W. Somerville, M.A., D.SC.

WILLIAM SOMERVILLE, ESQ., M.A., D.SC., Professor of Agriculture in the University of Cambridge, examined.

6327. Mr. Justice MADDEN.—You are Professor of Agriculture in the University of Cambridge?—Yes.

6328. I observe that you hold degrees conferred by the Universities of Edinburgh, Durham, Cambridge, and Munich?—Yes.

6329. And you have acquaintance with the teaching, I presume, in each of those Universities?—Yes.

6330. Now, commencing with the United Kingdom, in what Universities is Agriculture a subject of instruction?—It is a subject of instruction in Edinburgh, St. Andrews, Aberdeen, Durham, Leeds, Cambridge, Bangor, Aberystwith, and Reading, I think.

6331. You have included not only Universities, but some University Colleges—Colleges of a University type?—Yes.

6332. Commencing with the University of Cambridge, what is the course of instruction in Agriculture in that University?—The course of instruction there consists of General Science, and of Specialised Science, on very much the same lines as the other subjects that lead up to what is called a special degree.

6333. To what degree does it lead in Cambridge?—It leads to the B.A., and finally to the M.A.

6334. The ordinary Arts degree?—Yes.

6335. At what period of his College career does a student specialise in Agriculture?—Either in his second or third year, depending upon the particular point of progress to which he may attain.

6336. And is he permitted to substitute Agriculture for one of the ordinary courses leading up to an Arts degree?—Yes.

6337. Are there any honours or prizes awarded in Agriculture?—No, there are no Honours or prizes awarded in Agriculture in the University of Cambridge.

6338. Is your course of instruction a two years' course?—A two or three years' course.

6339. What classes of subjects does it comprehend?—If a man is going to take his degree in Agriculture he goes through the ordinary previous and general examinations, and then he takes Chemistry and Botany in their relations to Agriculture, together with Geology and Mechanics, and if he passes the examinations in those subjects he is awarded the ordinary B.A. degree.

6340. Is there any special practical teaching in connection with a farm?—The students go out to the farm once a week as a rule, and some of them do engage in actual manual work on the farm; but it is not compulsory from the point of view of obtaining a degree.

6341. Are your classes largely attended?—We have got rather more than forty undergraduates attending them at present.

6342. With what special purpose do they undertake this study—do they look forward to being instructors in Agriculture, or is it merely to enable them to take their place as farmers, with a higher class of education?—In Cambridge we do not come across very many young men that are going to be farmers; they are either going to qualify as instructors, or they have probably the prospect of succeeding to landed property.

6343. What proportion, speaking roughly, does the latter class bear to the entire—do most of your students intend to become instructors?—I should say not most of them; the smaller number would become instructors, and then another small proportion have land agency work in view; but I think perhaps about one half of our total number are not really studying with any very serious object in view.

6344. Do you regard a Chair of Agriculture as a useful part of a University system?—I do.

6345. Are you in a position to give us any information that you think would be useful to us, with regard to the other Universities and University Colleges which you have mentioned?—Well, the work at Cambridge is on somewhat different lines from what prevails in the provincial Colleges. At Newcastle, for example, or Edinburgh, the course is rather different. There they take a preliminary examination in general knowledge subjects, and subsequently the candidate goes on to study Pure Science, and specialises about his second or possibly his third year. The teaching is much more technical and much more specialised at those other Colleges than it is in Cambridge; the amount of specialisation at Cambridge—the amount of what one may call the application of Science to Agriculture—is rather limited. That is for the degree; but in Cambridge we have also a diploma, and the diploma covers a great deal more than the ordinary degree does. It is usual for a man to take both his diploma and degree in Agriculture; and if he takes the diploma he studies a considerable amount of extra subjects beyond those which he takes when going in for a degree.

6346. Are there a large number of candidates for the diploma in each year?—The number is growing. The Chair has only been established for two years, and the numbers are distinctly increasing. We get something like ten candidates in a year for the diploma.

6347. Some of the Colleges, you say, are more specialised—that is to say, attention is devoted to a greater extent to the practical side of Agriculture?—Yes.

6348. Do you consider a College of that kind a useful institution in a country like Ireland? I point my observations to an existing institution—there is a College in Galway, and it has been suggested that that College might be developed on the side of Agricultural teaching, and in the direction that you have indicated, that is to say, in the direction of practical teaching, and the practical application of Science to Agriculture. Do you think a College of that kind a useful institution?—I think it distinctly useful. It may not perhaps be attended by a very large number of students. I suppose the record of the attendance of Agricultural students at Galway in the past is not a very satisfactory one.

6349. Most Rev. Dr. HEALY.—There have been no such classes in Galway?—I thought there had been.

6350. There was a Professor originally appointed but subsequently the idea was not carried out?—I do not know that.

6351. Mr. Justice MADDEN.—We need not discuss in detail the causes which have been suggested as leading to that result; but would you, from your experience, advise us, if those causes were non-existent—the special causes to which I have adverted—to endeavour to revive in a place like Galway a school of the class which I have suggested?—Yes, I think it is certainly the right thing to do.

6352. The course of study there might be somewhat different, it might tend in a more practical direction than the course of study in a University like Cambridge?—Yes; it would depend a great deal upon the prospects of the students. I suppose in Ireland, as here, you would find that the best men were attracted away from the pursuit of Agriculture on the land to its pursuit as an academic or scholastic profession. The best of the students, of course, have the opportunity, as a rule, of obtaining fairly well-paid appointments, and the number that find their way back to the land, to gain a living as tenant farmers is very small. I think the young fellow who is going to be a practical farmer ultimately, will probably depend for his instruction in Agriculture rather upon the Secondary classes than upon the University Colleges. A very small proportion really of the young farmers ever go to the University Colleges at all; a larger number find their way into fairly good Secondary or Grammar schools, and if an Agricultural side were engrafted on to some of those Secondary or Grammar Schools, I think probably in that way one would get more into contact with the young fellow who is going to be a farmer ultimately. On the other hand, those who are going to occupy important positions as teachers will pass through the University Colleges, and, I think, that for them it would be very desirable indeed that opportunities should be given of instruction in Agriculture and Agricultural Science.

6353. You have an acquaintance with the educational systems of the Continent What place does Agricultural instruction occupy in those systems generally?—It occupies precisely the same position that any other Applied Science occupies.

6354. That is to say, in the Technical High Schools it occupies that position. Take the Technical High Schools in Germany, for instance?—Yes.

6355. Does it occupy the same position in the Technical High Schools there that Electrical Engineering does?—Exactly the same.

6356. There, however, they are independent of the Universities?—Some of them are. As a general rule, one may utilise these Technical High Schools as an avenue to a University degree. I think that applies, for instance, to the Agricultural High School of Berlin. I believe the University grants degrees to students who come from there. As a general rule, you do not find specialised Agricultural schools in Germany of

the highest type; you find very important Agricultural institutes or Agricultural departments that are part and parcel of the University, but you do not find that Agricultural schools very often pursuing an independent existence. There are some; for instance, there is a very important one at Hohenheim, in Wurtemburg, and at Gothenburg, but with very few exceptions they are attached to a University.

6357. Are they largely attended?—Enormously attended. A great number of them have got from 150 to 250 students.

6358. By what class of students—I mean as a general rule. What is their destination?—Their ultimate destination to a large extent is the Government service.

6359. As what?—As what are known as technical inspectors; they inspect amelioration works that are undertaken by the Government—drainage, irrigation, and so forth. When the surveyors in Germany are, generally speaking, Government officials, and it is with the view of qualifying for some of these posts, I think, that the majority of the students frequent the Agricultural schools of Germany, and the large farmers send their sons, and the landowners also send their sons to a greater extent than they do in this country.

6360. Do these institutions require any evidence on the part of students that they have received a liberal education, in the form of an entrance examination, or a leaving certificate?—Yes, they all do; they all demand the evidence of a leaving certificate.

6361. As evidence that they have received high class education in a Secondary school?—Yes, precisely. That is the invariable rule. There are no preliminary examinations in German Universities, as in this country. Of course in Scotland the same system exists to a large extent—that a boy presents his leaving certificate and is exempted from preliminary examinations. In England the system prevails to a certain extent—that is some teaching institutions will accept the Cambridge and Oxford Local Examinations as an equivalent. I think it is extremel desirable, if it can be worked, that when a young fellow comes up to a University or Technical School, he should be relieved through the agency of a leaving certificate of the necessity of doing what is really after all Secondary school work.

6362. Is there a specific degree in Agriculture given in any University at present?—There is no degree of Bachelor of Agriculture in this country.

6363. That is what I mean?—There is no Bachelor of Agriculture, but there is also no Bachelor of Engineering, I think. But you may take a degree in the department of Agriculture; in Edinburgh, for example, the Bachelor of Science degree is given in various departments, and amongst others it is given in the Department of Agriculture.

6364. Yes; we have been informed already that Agriculture, where it leads up to a degree, leads up either to the Arts degree, as at Cambridge, or to a degree in Science, as in some other Universities. Do you suggest that there should be a separate degree in Agriculture?. Do you suggest to us that if we were reframing or remodelling a University system, we should provide for a special degree in Agriculture, or that it should be part of the training leading up to a degree, either in Science or Arts?—I do not think it matters a great deal. In this country it is not the habit to multiply degrees. In America, of course, they do. In America, principally, the rule is that if a man takes his degree in Agriculture he is known as a Bachelor of Agriculture; but in this country, of course, the one degree covers a great deal, and on the face of it it does not indicate whether a man is an agriculturist, or an engineer, or a chemist—on the face of it I mean, but if any one wants to know in what he has specialised, of course, the College or the University authorities are in a position to let a properly authenticated inquirer discover at once.

6365. Would you allow a student aspiring to the degree of Bachelor of Science in Agriculture, to specialise immediately on entrance, or do you think he should pursue an Arts course up to a certain point?—I do not think he should pursue an Arts course after he joins the University. I think that all his Arts work should be got rid of before he enters if possible.

6366. As evidenced by a leaving certificate?—As evidenced by his leaving certificate or by an examination that he would pass on entering. I think that all the preparations for this examination should be got over before he comes to the University, and after he joins the University I do not think he should be allowed to specialise for some considerable time; he is bound to lay, or ought to lay, a fairly firm foundation of General Science before he can be depended upon to make any good use of specialisation.

6367. Most Rev. Dr. HEALY.—Comparing from your great experience England with the Continent—Germany, and so forth—do you think that Agricultural Education is more backward in England than it is in France and Germany?—I should not say more backward, but there is not so much demand for it here.

6368. That is what I mean?—We can give them as good an education here for ordinary purposes as they do in Germany, but there is not so much demand for it.

6369. I suppose the desire for Agricultural Education is growing gradually in this country?—Well, the number of students under instruction now compared with ten years ago is a very large one indeed.

6370. Do you personally know Ireland?—Oh, yes; I know Ireland fairly well.

6371. I suppose you know Agriculture is in a very backward state in Ireland?—Well, I do not know that I do know that.

6372. You need not have the least hesitation in answering that affirmatively?—Well, I think there are some extremely good agricultural districts in County Meath and County Wexford, for instance.

6373. Have you crossed the Shannon?—I have been to Galway and Mayo.

6374. What did you think of the Galway Agriculture?—Well, they have got to contend with a terrible soil and a bad climate.

6375. I suppose that is where Agricultural Science is needed most?—I am afraid Agricultural Science cannot mend the weather very much.

6376. It might do something to take measures and to take precautions to guard against the effects of the weather, might it not?—I do not know any place where Agricultural Science is appreciated more than in County Galway. As regards spraying potatoes, for instance, I do not know any part of the country where the spraying of potatoes has got such a firm hold as in Galway and Mayo.

6377. Still there is a good deal of room for improvement in parts of the country?—No doubt.

6378. As a matter of fact, you do not know it perhaps, but I will put it in the form of a question. Do you know that there are practically no Agricultural teachers trained in Ireland at the present time; those we have are not Irishmen?—I think that is rather too broad a statement. You have had Glasnevin going on now for a good while.

6379. It is a fact, I assure you?—Is Professor Carroll not an Irishman?

6380. I was going to make an exception in his case. That is the single exception. I know people who have been looking for Agricultural teachers, and they could not get a teacher in all Ireland, and Professor Carroll himself said the same—that he could not get one—except himself, I suppose—in the whole country?—Yes.

6381. Well, the National Board of Education has been dabbling in Agriculture for several years—some forty or fifty years; but that is the result of their Agricultural instruction—that they have not produced a single teacher, with the exception of Professor Carroll, in the whole of Ireland, capable of conducting an Agricultural school, and when the Board of Technical Instruction wanted Agricultural inspectors, they found it impossible to get them in Ireland, and they had to import them from England and from Scotland, to send them out as itinerant teachers and instructors. Do you not think that is a state of things that ought to be corrected?—Yes; it is a pity it could not have been corrected earlier, when these appointments were all vacant.

6382. That is precisely what I think myself. With the view of correcting that, and of providing teachers, and Professors, and skilled agriculturists, now that the demand for instruction in Agriculture is increasing, do you not think it desirable to have Agricultural Colleges and schools throughout the country generally?—Yes, certainly.

6383. One for each province—call it a school, or College or what you like?—Yes; probably a higher Agricultural College for each province is wanted, with probably a considerable addition in the form of Agricultural sides in Secondary schools.

6384. You wish to see Agriculture taught to some extent at least also in the Secondary schools?—I do, indeed.

6385. And do you think it would be desirable that the Agricultural Board should make provision for that purpose?—I am sure it would be.

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6386. And I suppose it would be desirable also if the National Board would co-operate with them to the extent of their power; they could do a good deal in that way?—Certainly.

6387. I think there is no doubt at all about that. Would you not think it also desirable, with the view of inducing students to take a greater interest in Agricultural Education, to provide some kind of Bursaries or Scholarships for the scholars?—Yes; without some such assistance I am afraid many of the best boys would never be able to get there at all.

6388. It would be desirable to have such Bursaries to attract the students?—Yes.

6389. Besides, the Agricultural students might not be in a position to continue their studies, and stop away from their farms, without some assistance?—They would not in many cases.

6390. Speaking specially of Galway, to which Mr. Justice Madden referred, would you think this a feasible proposition? Galway has at present a University College, the number of students at which is proportionately very small; it undertakes to teach in the various Faculties of Arts, and Law, and Medicine, and so forth. It has been suggested that it would be more desirable, seeing that the number of students is so small, to change the constitution of the College in that respect, and to confine it chiefly to Arts and Agriculture, and Science, associated with Agriculture; do you think in the West of Ireland such an Agricultural school or College would be likely to be successful?—It seems to me that Agriculture is more likely to be successful than any other Science there; but, of course, in judging of the demand for Agriculture as compared with, for instance, Medicine, one has always to remember this—that the certificate or degree that a young student gets in Agriculture is not of immediate value to him as a rule, whereas in the case of Medicine, when a doctor gets his diploma, he can turn it almost instantly into a means of livelihood.

6391. For the purposes of practical Agricultural Education of the kind you contemplate, would it be necessary to have a large farm, with all the necessary appliances?—Well, that is a difficult question to determine. I think a farm, on the whole, is desirable as an addition to the Department; but its object is apt to be misrepresented and misinterpreted; that is to say, many people imagine that a farm attached to an Agricultural department should, above all things, be profitable. If one sets out with that idea, of course one is almost certain to be disappointed, because a farm attached to an Agricultural department ought, it seems to me, really to be regarded as Open-air Laboratory, on which experiments are conducted and priciples are demonstrated; but I am afraid there is not very much chance of running a University farm on a commercial basis; and if one does not run it on a commercial basis then it costs a great deal of money, of course.

6392. Even in Glasnevin they do not run it on a commercial basis. As far as I can gather the State has spent a good deal of money there on the maintenance of the farm; but it is not a money-making concern, though it has done very good work. Would you not think such a farm a desirable means of showing the students practically the effects, for instance, of different manures, the rotation of crops, and everything of that kind?—Distinctly; and more so, probably, in the West of Ireland, because there you have not usually so many good farms in the neighbourhood as you have round about Cambridge or Edinburgh, and, therefore, it would be more necessary, probably, in Ireland, even than here. But even in this country a very large number of the Agricultural Colleges and Agricultural Departments of Colleges have got farms attached to them.

The Witness withdrew.

Professor JULIUS WERTHEIMER, B.SC., B.A., F.I.C. Principal of the Merchant Venturers' Technical College, Bristol, examined.

Professor Julius Wertheimer, B.SC., B.A., F.I.C.

6393. Mr. Justice MADDEN.—You are the Principal of the Merchant Venturers' College, in Bristol?—Yes.

6394. You are also Hon. Secretary of the Association of Technical Institutions?—Yes.

6395. And a member of the Technical Instruction Committees of the Bristol City Council and of the Gloucestershire County Council?—Yes.

6396. In connection with these different institutions you have doubtless paid a great deal of attention to the question of higher Technical Education?—I have.

6397. You are aware that we are inquiring into the subject of Technical Education, but only in its relation to University Education, in so far as it may be regarded as connected with or leading up to University Education?—Yes.

6398. And you will bear that limitation in mind in giving your evidence. Now, what is the constitution of the Merchant Venturers' Technical College at Bristol?—It is a College maintained by an ancient guild, the Society of Merchant Venturers, which dates back some 500 years, and which was originally in possession of powers in Bristol, similar to those that the London City Companies have in London, that is to say, no one was able to trade over seas unless he belonged to that guild. These functions have disappeared, but the Society is still a corporate body, and possesses corporate funds, and it has spent some £70,000 in working and equipping a College, and it makes good the annual loss on its working, the object being to make it an institution to aid the manufactures and commerce of Bristol and the West of England.

6399. What class of Technical Education do you give—I mean to say, what standard do you aim at?—We aim at a University standard; some of our students study for the London University degrees.

6400. You are not affiliated with any University?—No.

6401. Your students who aspire to a University degree take the degree of the University of London?—Yes.

6402. Are there many students in the College?—Yes. There are over 220 adult day students. And there are also over 1,700 evening students; but only a small proportion of these are doing work of a University standard; there is a boys' school attached to the College, too.

6403. Do a large number of your students take the degree of the University of London?—No, not at present; because it is mainly those who intend to become chemists for whom the degree, as at present arranged, is suitable. When the new degrees in Engineering and Economics, the regulations for which are now being drafted, are available, probably a considerably larger number of our students will prepare for them.

6404. What is the course of study in the Technical College—what subjects does it embrace, and over what period does it extend?—It extends, as a rule, over three years; very few students remain for four years. It includes preparation for various branches of industrial life—engineering of various kinds, men who intend to go into the building trades, men who intend to become chemists, mechanics, or metallurgists. Those are the principal departments. There is also a navigation department; but that is intended mainly for those who intend to become master mariners.

6405. You aim at giving a similar kind of instruction to that which is given by the Technical High Schools of Germany or America?—That is what we aim at; but we do not do it. Scarcely any British institution gives education comparable with that which is given in the Technical High Schools of Germany and America, for the simple reason that the age of entry in our institutions is lower than on the Continent, and also the length of time the pupils stay is very much less and their previous preparation is, unfortunately, inferior. I am speaking now from definite particulars which are in my possession.

6406. Have you any suggestions to offer as to means of improvement in those particulars?—The first point, as far as England is concerned, is, that there must be an improvement of Secondary Education. Secondary Education is in a very chaotic condition in England, and very backward as compared with both Germany and America. In the second place, employers in this country do not attach the same importance to technical training that they do on the Continent and in America; nor has this country spent anything like the same sums on this kind of training, nor provided anything like the same facilities for obtaining it. In illustration of that I can put in, if you wish it, some special information. Recently the Association of Technical Institutions, of which I am secretary, has collected information with regard to this

matter, and we find that there are, altogether, only 3,873 day students of Technology in all the British Universities* (I am afraid we have not much information from Ireland, although we asked for it), the University Colleges of Bristol, Cork, Dublin, Edinburgh, Newcastle, Nottingham, and Sheffield, and practically all the Technical Colleges and Schools in the kingdom —although we have counted students beginning at the absurdly low age of fifteen. Now, compare that with what there is abroad, and take a single German Technical High School: there are, at Charlottenburg alone, over 2,800 students, all over eighteen years of age.

6407. That number is increasing—we have received information on that subject?—Yes; you probably have later information on the subject than I have; but that was the number last session.

6408. We may take it that this was the number last session?—Yes; it is increasing every year. I should like to show you this diagram, which shows the comparative number of day students of technical subjects in England and abroad.

6409. I should like to have that clearly on the notes. You say, as I understand, that in the United Kingdom the entire number of Engineering students of seventeen years and upwards is 400, whereas, in the one Technical School at Charlottenburg the entire number over twenty is about 500?—Yes; I shall be very glad to supply you with this document in about a fortnight; but at present it is a private document.

6410. It is a report not yet presented, I suppose?—Not yet issued.

6411. As soon as it is presented we shall be very glad if you will let us have a copy?—Yes, certainly.†

6412. It is a report from what body?—It is a pamphlet issued by the Council of the Association of the Technical Institutions. Diagrams 1 and 2 in it show the difference between the number of students, and Diagrams 3 and 4 show you the enormous difference between the sizes of the institutions. To show the difference between the way in which English employers and American employers appreciate this kind of training, I may say that, notwithstanding the comparatively small number of students turned out by the Colleges in England, even that small number find a difficulty in getting suitable places, whereas there is a single institution in America, the Massachusetts Institute of Technology, Boston, from which each year 300 students leave, none of whom are under twenty-two, and the demand among the American manufacturers for these young men is so great, that the number of applications for those students is larger than the number of students turned out, and every student has a place ready for him before he has completed his course.

6413. That you regard as one of the difficulties in the way—the indifference of employers to a degree or diploma obtained in that way?—Yes.

6414. Another obstacle that you mentioned is the neglect, in Secondary Schools, of Technical Education?—No; not that.

6415. I understood you to say there were defects in the Secondary Schools. What class of defects?—The Secondary Schools in England are not organised in any way, to begin with, and the time during which the pupils stay is very much shorter than it is in Germany or America; they leave very much younger. In the majority of University Colleges and Technical Colleges here a comparatively small number of students enter at a later age than seventeen; and many enter, in most of the University Colleges in England, as low as sixteen, and even below sixteen, with a childishly easy entrance examination; but the contrary is the case in America; nobody is admitted under eighteen, and the entrance examination is really very stiff.

6416. Do you think that the practical scientific side of education is developed sufficiently in Secondary Schools in England?—I do not think the Secondary Schools ought to attempt Technical Education; they ought to give a sound Secondary Education, which ought to train the mind. In choosing the subjects by which to train the mind, I think it would be better to choose those which would be likely to help the students in their after career; for instance, boys should take German instead of Greek, because German is so much more valuable; it gives, in my opinion, an equally good mental training, and at the same time is an infinitely better subject for a student who is to engage in technical work, because it is practically essential to a technical student to know German in order to keep himself abreast of the latest literature on such subjects.

6417. It has been suggested to us that the teaching of Practical Science should form a part of our whole educational system in Ireland?—I think so, undoubtedly.

6418. From the Primary School upwards?—I agree entirely; not with the object of giving Technical Education in the schools, but because I think it is one of the means of developing a side of the child's mind that you cannot get from any other source. Training in Languages is valuable; but I think that training in observing facts, and drawing inferences from them, is valuable, too. But teaching of the kind I am speaking of I should not call technical training. You ought not, in a Secondary School, to teach a boy Chemistry in order to make him a chemist; if you teach him Chemistry and Physics you ought to do it with a view to developing his intelligence and his faculties of observation, and of drawing inferences from what he observes.

6419. But, taking the phrase "teaching of Practical Science" in that sense, you would have teaching of that kind in the Secondary Schools?—Certainly; in every Secondary School.

6420. There is in Bristol another College, mentioned in your Summary of Evidence. What is the constitution of that College?—It is a University College, which was established some years ago on lines, no doubt, well known to the Commission—the usual lines of the University Colleges in England.

6421. Does it pay special attention to technical instruction?—Not to any branch, except Engineering; it has Engineering courses.

6422. Are there any relations between it and the Merchant Venturers' Technical College?—There has recently been an attempt to co-ordinate the work of the two Colleges, but the negotiations have not yet come to a conclusion.

6423. I see you state in your summary that Bristol does not need, and could not support, more than one competent place of technical instruction?—We feel that. I mean, of course, not more than one place of University rank. Bristol is not a manufacturing city, to compare, for instance, with Leeds or Sheffield; it is very largely a mercantile city, and only to a relatively small extent a manufacturing city; and we feel it is impossible to have two places, equipped as they ought to be, at considerable expense, doing the same kind of work.

6424. Applying that observation to the city of Dublin you would apparently suggest that a single properly equipped College of Science, with the expensive appliances, laboratory, and apparatus now required for that purpose might suffice for the entire city, and might be utilised by different teaching institutions in Dublin?—I know Dublin slightly, and from what I know of the population it has to deal with and so forth, I should certainly say that one institution of the first grade is the most that could reasonably be provided in Dublin. It ought to be very well equipped, and would be infinitely better than two institutions, both imperfectly equipped, and not having the necessary number of students. I attach importance to the number of students for this reason: if you adopt the system of Germany and America, of gathering together a large number of students, you are able to have a large number of Professors. The system in England, unfortunately, is to have a relatively small number of students, which means, of course, a small number of Professors. These have to deal with the whole range of subjects, whereas in Berlin and Boston they have a very large number of Professors, each of whom, instead of having to deal with a wide range of subjects, is able to specialise. For instance, in Engineering, one man gives instruction about Electrical Engineering, another about railway bridges, and so on, and so you get a very much higher type of instruction. If you had, in Dublin, two institutions, neither institution would be big enough to get a really good staff of Professors, and I do not think either would compare favourably with some of the institutions abroad. As regards the possibility of such an institution being used by different bodies, that is a point on which, I am afraid, I am not competent to speak, as I do not know sufficient

* See Returns on page 274.

† "Are our Industrial Leaders efficiently trained?" (A comparison of Technical Education at Home and Abroad). A pamphlet prepared by the Council of the Association of Technical Institutions. Bristol: Henry Hill, 1901.

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Professor Julius Wertheimer, B.Sc., B.A., F.I.C.

about the local circumstances to know whether it would be possible or not.

6425. But provided there are no difficulties in the way of the utilisation, by two different teaching Universities, of the same College, or Faculty, of Applied Science, you would regard it as desirable?—Yes, certainly.

6426. The expense of equipping laboratories for the purpose of teaching practical Science has enormously increased of recent years?—That is so.

6427. Have you had occasion to form an estimate of the cost of equipping a College of Science suitable for the requirement of a city like Dublin—of course I mean an approximate estimate only?—I have had to supervise the estimates for equipping many individual laboratories in different places, and having regard to what has been spent in other places I should say that to equip a Technical College in Dublin, the building and equipment should not cost much less than a quarter of a million, if you really want to make it first class. I have regard to the fact that Dublin is the capital of Ireland.

6428. Having regard to the amount spent on the institutions abroad, of which you have spoken, that is your opinion?—Exactly. I may mention that the Manchester Technical School has cost about that sum, and the proposed new Technical College at Glasgow, which is to be in addition to the University there, has cost a similar sum, and I hope, in the end, we may spend something like that at Bristol.

6429. In addition there is the cost of a staff of Professors?—Yes; I am speaking now merely of the buildings and equipment. May I add that personally I am very doubtful whether, having regard to the population of Ireland, you want more than one or at the outside two, such institutions in the whole of Ireland.

6430. That is very germane to our inquiry. We start with this proposition, that we require a properly equipped College of Science in Dublin. Whether it is desirable to have similar Colleges in Belfast and Cork is one question, and another question is whether it would be practicable. Now, on the former question, do you think it desirable that if possible there should be a properly equipped College of Science in Belfast, bearing in mind that industries, up to the present time, at all events, exist to a much greater extent in that part of Ireland?—May I explain what I mean. One really first-class institution would be sufficient for Ireland, but you certainly ought to have in Cork and Belfast, and in all large centres of population, institutions giving Intermediate Technical Education.

6431. By "Intermediate" do I understand you to mean institutions associated with what we call Secondary Schools?—I was not using it in that sense. I think the word "Intermediate" in Ireland has a specific meaning.

6432. And in Wales?—I did not mean that; in Wales at least it refers to Secondary Schools. I meant more particularly places giving evening instruction, which, of course, must be in the localities. The other class of students comprises those who would be trained in the daytime for a considerable number of years, and would be given a higher class of education. I think one institution of that kind would certainly suffice for the present population of Ireland.

6433. Professor LORRAIN SMITH.—What do you do in Bristol as regards the teaching of Commerce?—We have a Commercial School, which is called the "City of Bristol School of Commerce." It is a branch of the College, and has been established by the governors of the College, with the advice and goodwill of the Bristol Chamber of Commerce.

6434. How far did the advice extend—what did it amount to?—We had a Joint Committee of the two bodies to devise a scheme; the Chamber of Commerce has not provided the funds, but it gives prizes. The Merchant Venturers provide the funds.

6435. Did they help you to find practical teachers?—They did; for instance, one of the Lecturers on Business Methods is in the employment of the Chamber of Commerce; he is senior clerk to the Chamber of Commerce.

6436. In regard to the lectures on Business Methods, do you manage to get men engaged in Commerce to undertake teaching in the school to any extent?—No; that is one of the difficulties we have to contend with, and it is a difficulty that exists almost everywhere, because a man who holds a first class position in Commerce is not willing to come for any pay that most institutions can offer; he can make far more out of commercial life than out of teaching.

6437. What has been attempted in several places is that a man should give his services for practically a nominal fee, or for no fee at all, out of public interest for the work, and should give a limited amount of his time—short courses of lectures?—Yes; a few lectures have been given in that way voluntarily by leading members of the Chamber of Commerce themselves, but they are rather in the nature of public lectures than teaching.

6438. Is there a movement in Bristol to co-ordinate the technical instruction with the teaching in University College?—There is a strong wish on both sides for something of that kind.

6439. "Co-ordination" is the word used?—Yes, co-ordination.

6440. I suppose you are hardly in a position to give us any of your experience on that subject; if so, it would be useful to us, as we may probably have to face the same difficulties?—No; the matter is still under consideration, and I do not know how long it will be before it is definitely decided.

6441. I see there is a suggestion that there should be assigned to the Technical College all technical work, that is, all subjects necessary for the proper education of persons to be engaged in manufactures. For example, Mining, Metallurgy, and Engineering; while such subjects as Commercial History, Economics as applied to business, and Modern Languages, in so far as required for Commerce, should be assigned to the University College?—No; all the subjects you name should be assigned to the Technical College. This is the suggestion of the Merchant Venturers, but it has not yet been accepted by the University College.

6442. Has there been any agreement arrived at as to what shall be the governing body?—No; that is a very difficult problem in Bristol, because the Merchant Venturers, being incorporated by Royal Charter, would not surrender their individuality. They want to have autonomy.

6443. That creates a special difficulty?—Yes; it is a special difficulty as regards Bristol. It is one that, of course, does not exist everywhere.

6444. Apart from that, you do not see any inherent difficulty in co-ordination between a Technical School or College and a University College?—No. At Sheffield the Technical School is united with what was called the Firth College, to form a University College; but even there the problem has been a rather difficult one, because although the governing body of the University College nominally rules the Technical School, there is a specific clause in the statutes which lays down that the University College authorities may make representations to the Technical School Committee, which the Technical School Committee must consider; but the Technical School Committee need not act upon them unless they like; so that there is a considerable amount of liberty left, and I think rightly left, to the technical department.

6445. It was stated by a witness that an arrangement had been come to by which the Heriot-Watt institution was co-ordinated with the University in such a way as to be complementary?—Yes; but it has been done in this way: the Heriot-Watt institution sends students in certain subjects to the University, and the University sends students in certain other subjects to the Heriot-Watt institution. We thought of that arrangement in Bristol at one time, but after talking it over we came to the conclusion that it would be inconvenient—that the students would have to run about too much from one place to another. In Edinburgh, of course, the conditions may be different. I do not know how near the Heriot-Watt School is to the University.

6446. It is only across the street?—Then, of course, there is no difficulty; but the University College, Bristol, is at the top of the hill, and we are in the heart of the city.

6447. What is the distance?—It is less than three-quarters of a mile; but Clifton, as perhaps you know, is at the top of a very steep hill, and to get from one institution to the other takes a certain amount of time.

6448. I have one more question: with regard to students who go in for University degrees, do you recognise students at evening classes as eligible, or do you confine your degrees to students attending day classes?—That is not a question for us; it is for the University of London. I may, however, mention that, at the recent examinations in October, four students went in for

degrees in Chemistry. We are for the most part concerned with Chemistry in the matter of degrees at present. Three of our day students took degrees, with first-class Honours, in Chemistry, and one evening student got a Pass degree. So that it is possible, and I think it should be possible, for an evening student to get a degree.

6449. The difficulty which presents itself, to my mind, with regard to giving degrees to evening students, is partly a practical one: that in evening classes the work is more elementary than the teaching carried on in the day classes; and if you wish that the work in both the day and evening classes shall be of this advanced kind, you must have three sets of classes going on; that is, advanced day classes, advanced evening classes, and elementary evening classes, and so putting a heavier burden on the institution?—I entirely agree with you in that. I do not think myself, as a rule, that an evening student ought to be advised to aim at a University degree, and I certainly do not think the University degree ought to be, if I may use the word, degraded to the level of what the average evening student can do. If so, it would, in my opinion, be an exceedingly poor kind of thing.

6450. It has been urged by some witnesses that it should be a duty of a University to meet the want of that class of students?—Well, I do not think a University degree should be brought down to the level of what can ordinarily be done by an evening student; certainly not in the matter of technical knowledge; because in order to qualify for a degree worth anything, a large amount of laboratory work should be done, which could not possibly be done by an evening student. However, I would not absolutely shut him out. But you will understand my point when I tell you that, whereas an evening student of ours took a Pass degree, second class, three of our day students took first class Honours, and the difference between a degree with first-class Honours and a second-class Pass, is enormous. They do not mean the same thing at all.

6451. And you are of opinion that to make the teaching in the evening classes of University rank would greatly increase the burden on the institution?—Yes, enormously.

6452. Dr. STARKIE.—Is there much demand in Bristol for men who have been trained in commerce in the College?—In the boys' school, where preliminary training is given, and which is separate from the rest of the College, boys are trained up to the age of sixteen years; and there is a large demand for those boys—so large that we cannot supply it.

6453. What training do you give those boys?—We give them a training in French and German, in English, in the elements of Mathematics, in Natural Sciences, theoretical and practical, and in Shorthand, and if they wish it, in Book-keeping.

6454. With the exception of Shorthand and Book-keeping, the education is like the foundation of an ordinary good general education?—Yes; but we teach French and German in a way different from that usually adopted. We teach boys to speak and write the languages. We attach more importance to a boy's being able to speak and write the language, though he does not know the niceties of grammar, than is the case at an ordinary school, where boys are prepared for Oxford or Cambridge examinations, and where they must know the niceties of grammar, although nobody ever asks them whether they can speak or write a word of the language.

6455. I suppose you are aware that in some of the Universities they are abandoning the old system of requiring students to understand the niceties of grammar in favour of the other and more practical system—we are certainly doing it in Ireland?—I am very glad to hear that you are; but it has not, as yet, been done in England. I have just induced the Society of Arts to start an examination in colloquial French and German; but, with that exception, nothing of the sort has as yet been done in England—the examinations all go upon niceties of grammar, and not upon the practical knowledge of the language.

6456. As a matter of fact I may tell you that we have, in the Intermediate examinations, abolished the grammar paper altogether?—I think that is, perhaps, going too far. I would not discard grammar altogether; but certainly I attach much importance to the ability to speak and write the languages.

6457. We—that is, Mr. Justice Madden and myself—are of opinion that you can better test the students' knowledge of the grammar of the language from the way he writes his composition paper than from a paper set in the grammar?—I agree with you in that.

6458. With regard to Commercial Education, do you agree with what is called the "Bureau" system they have in some foreign countries?—I do not altogether agree with it. I think that if a boy has been properly trained he can learn that kind of work much better when he goes into a commercial office than he could in a school.

6459. I suppose that, as a rule, in Bristol most boys enter into actual occupation in commercial offices about the age of sixteen?—Yes. That is the great weakness of our system. It would be much better if employers could be persuaded to wait for two years, and allow those intended for responsible posts to enter at eighteen.

6460. What kind of training should you suggest that the boys ought to have before entering into a commercial office?—In my opinion they ought to be trained in Economics, and in Banking, and ought to know something about commercial law.

6461. Would not these be subjects proper for a University?—Yes; and when the University of London gives its degree in Economics and Commerce, I think it probable that we shall have a number of young men preparing for it, so as to fit themselves to go in for the higher posts in commercial life.

6462. Should you advocate Commercial History, Commercial Geography, and those other subjects connected with Commerce, being taught in the Secondary Schools?—Certainly not before the age of sixteen.

6463. Great pressure has been brought to bear upon the Intermediate Education Board in Ireland, to introduce in the Middle Grade examinations, the subjects of Commercial History and Geography?—We have taught our students History and Geography from a commercial point of view, and how the geographical configuration and circumstances of a country lead to certain industries being developed in certain districts.

6464. Might not that be properly called part of general Geography, and might not facts of that kind be of interest to the general student?—Certainly; but I am strongly of opinion that Commercial and Technical Education ought not to begin before the age of sixteen. A boy ought to be trained before that age by the use of subjects that will help him in his future career; but he ought to get a good general education before he specialises.

6465. Professor DICKEY.—You have mentioned that some of your students proceed to the London University for their degrees?—Yes. The London University is now a teaching University, but it is still an examining body for the whole country.

6466. Do any of your students go to the University of Wales?—No. It is only a teaching institution. Nobody can enter for a degree in the University of Wales unless he has been educated in one of the constituent Colleges.

6467. I see you state in your Summary of Evidence, "The Governors sympathise also with the wish of the President of University College (the Bishop of Hereford), that the two Colleges may become the nucleus of a University of Bristol"?—Yes; that the Merchant Venturers' Technical College and the University College may form the nucleus of a University.

6468. In that event the Technical College would not be of much service, except to the people of Bristol?—Oh, it would. At present the students of our Technical College do not come from Bristol alone—many of them come from the surrounding counties, and some even from the Colonies and abroad; and it would still be open for such students to come to the College for their education, just as they might go to London or Dublin.

6469. Why should not the two Bristol Colleges be affiliated to the University of Wales?—Of course, they might; but Bristol is not in Wales. The three Welsh Colleges are those of Cardiff, Aberystwyth, and Bangor. We think Bristol ought to have a University of its own, and that those two Colleges, the University College and the Merchant Venturers' Technical College, might be made the nucleus of a University for Bristol.

The Commission adjourned until the following morning.

SIXTEENTH DAY.

TUESDAY, DECEMBER 17, 1901.

LONDON.

Dec. 17, 1901.

AT 11 O'CLOCK, A.M.

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman); The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.; The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.; Sir RICHARD CLAVERHOUSE JEBB, LITT.D., LL.D., D.C.L., M.P.; Professor S. H. BUTCHER, LITT.D., LL.D.; Professor J. A. EWING, M.A., LL.D., F.R.S.; Professor JOHN RHYS, M.A., D.LITT.; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT.D.; WILFRID WARD, Esq., B.A.; Rev. Professor R. H. F. DICKEY, M.A., D.D.,

and Mr. J. D. DALY, M.A., Secretary.

(In the unavoidable absence of Lord Robertson the Chair was taken by VISCOUNT RIDLEY.)

Right Hon. Christopher Palles, LL.D

The Right Hon. CHRISTOPHER PALLES, Lord Chief Baron, B.A., (Univ. Dub., 1852); LL.D. (same University, 1860); Chairman of Board of Intermediate Education, Ireland; Commissioner of National Education, Ireland; Member of the Senate of the Royal University, Ireland, and of its Standing Committee, examined.

6470. Viscount RIDLEY.—My Lord Chief Baron, I understand that you have been good enough to come here, as you have stated in your Summary of Evidence, at the invitation of the Chairman of this Commission, to give the Commissioners the benefit of your views upon this very important and difficult question?—Yes, my lord.

6471. And I understand, from the paper which you have been so good as to send to the Commission, that you would, in the main, desire not to make a statement, but to be asked questions, as they may occur to the Commissioners?—I at first wished that, my lord; but since I sent in that short Summary, I have ascertained from your Secretary that the Commissioners considered it was for the general convenience, both of themselves and of the persons who might afterwards read the evidence, that there should be a statement by the witness in the first instance, in order that his main views might be consecutive, instead of being interrupted by question and answer. In consequence of that I have prepared myself to make a statement upon each of the matters mentioned in the Summary, if that is the wish of the Commission.

6472. That is the point to which I was coming, and I am sure the Commission would gladly take that view of the matter. Perhaps you will be good enough to give us your statement in the form in which you have prepared it. You will understand that the Commission desire to have your views upon any point in connection with this great and important matter, which is referred to them upon which you have an opinion that you desire to express?—By reading as much of the published evidence as the time at my disposal enabled me to do, I have endeavoured to ascertain the main questions which have developed themselves in the course of the inquiry. Such of those main questions as I feel competent to express an opinion upon are five:—

(1.) Is there a need for additional provision for the higher education of Roman Catholics?

(2.) If there be such need, what should that additional provision be?

(3.) What should be the character of the proposed new University, if one is to be founded, and of the proposed new College?

(4.) Should there be an additional University established in Belfast? And if not, should the Royal University be continued?

(5.) Should any provision be made for the higher class of industrial, commercial, and Technical Education?

I am prepared to state my views in detail upon such of the first four questions as the Commissioners may desire to examine me upon. Upon the fifth question, although I entertain a strong opinion that facilities should be afforded for University training in industrial, commercial, and technical subjects, my evidence must be of a general character, as I have not had an opportunity of satisfying my own mind as to the details by which this object can be best accomplished.

1. "IS THERE A NEED FOR ADDITIONAL PROVISION FOR THE HIGHER EDUCATION OF ROMAN CATHOLICS?"

I answer the first question emphatically in the affirmative. I was a party to the Declaration of the Roman Catholic laity in 1870, and to its reiteration in 1897; and I abide by the principle expressed in those documents. A full discussion of the question would involve much time, and would necessarily be little more than a repetition of much that has been already laid before the Commissioners by other witnesses. I have read the evidence of the Bishops of Limerick and Elphin; of O'Conor Don; of Colonel Ross of Bladensburg; and of the Rev. Dr. Hamilton. Speaking generally, I adopt the evidence given by each of those gentlemen as to the grave necessity which exists for additional provision for the higher education of Roman Catholics.

My own recollection extends over the entire period referred to in the most interesting statement of O'Conor Don. I am personally cognizant of all the matters he has mentioned, save such as, necessarily, were known only to Members of Parliament; such, for instance, as the reasons which actuated a particular party in adopting a particular course in Parliament. I have a distinct recollection of the preparation of the Declaration of the laity in 1870. Mr. More O'Ferrall, who, with O'Conor Don, prepared that Declaration, and procured it to be signed, was a relative of my own.

The statement of O'Conor Don, that that Declaration was the outcome of a movement by, and represented the honest opinion of, the laity, as distinct from the clergy, requires no corroboration, but as in some quarters it is suggested that this University movement is wholly of ecclesiastical creation, I think it right to add that I join my testimony to that of O'Conor Don, that this Declaration was the spontaneous outcome of Catholic lay opinion, and represents their views, as distinguished from those of the clergy. That this is so will clearly appear by comparing the demand made by that Declaration with that which at that time—1870—was put forward by the Roman Catholic Ecclesiastics, when it will be found that the former falls short of the latter. The primary claim of the Bishops and the clergy in 1870 was for a purely Roman Catholic University. If the Declaration of 1870 be carefully examined it will be found not to entirely adopt that claim.

If it be desired that I should state my own views more specifically, I shall do so in as few words as possible. I class them under six heads:—

(*a.*) That in this respect there is a want of religious equality, which not only is at variance with the present constitution of the empire, but is essentially unjust.

(*b*). That this want of religious equality has worked, and is continuing to work, to the detriment of the State, by creating, in Ireland, unrest, dissatisfaction, and want of confidence in the State; and by subjecting the State to the disadvantage inherent in the fact that at least one half of such of its subjects as are fit for University Education are debarred from obtaining it.

(*c.*) That the system of Intermediate Education, established in 1878, by leading the most distinguished of the students in Ireland in Secondary Schools (many of them drawn from the humbler classes, some from the very humblest), to the threshold of the University, and there leaving the majority of them, partially uneducated; unfit for any employment available for them in their half educated state; taken away from the sphere in which they otherwise would have moved; unfitted, by the partial cultivation of their intellects, to submit to become common labourers or small artisans, has created a class, some of which are dissatisfied, disaffected, and—I go the length of saying—dangerous to the State. Many of them find such casual employment as enables them to make their opinions public; and thus their dissatisfaction is widely spread. Worse still, I fear that some of them become teachers of Intermediate Schools, with the danger of imbuing their pupils with these opinions.

(*d.*) In consequence of the absence of University Education acceptable to Roman Catholics, many of the teachers of Catholic Intermediate schools are insufficiently and imperfectly educated. They have neither sufficient knowledge of the subjects they profess to teach, nor have they learned even the elements of the Science of Pedagogy.

All these matters have already been discussed at such length that I feel that it would merely incumber your notes were I to enter upon them in greater detail.

(*e.*) My fifth reason is because it has been publicly stated by at least one, if not two, eminent Ministers of the Crown that in consequence of the want of education of Roman Catholics generally he has often been unable to select from amongst them persons competent to fill certain vacant situations under the Crown to which he personally would have preferred to appoint Roman Catholics. As to this I shall do no more than quote one passage from a speech made by Mr. Morley in the House of Commons on the 17th February, 1898. I quote from Parliamentary Debates of the Session 1898, Vol. LIII., Column 934:—

> "What did the present Chief Secretary say before he had been a year in office? He made a very remarkable observation, which I am well able to bear out. He said that he had been constantly obliged to pass over Roman Catholics in making appointments in Ireland because they had not had the same educational advantages, and were not in the same educational position as Protestants. I can only say that my own experience absolutely corroborates that view. If there ever was a Minister whose desire it was, as it is the interest and desire of all Chief Secretaries of whatever party, to give Roman Catholics a larger and wider place in the administration of Ireland, it was my case. Of course, I was constantly obliged to disappoint my hon. friends below the gangway, because candidates were not up to the educational standard which the posts required. I say that it is idle for us when we have Home Rule discussions going on to point to the enormous number of Protestants—the great preponderance of Protestants in offices in Ireland. It is not easy for us to found arguments, as many of my hon. friends did in the course of the debates on the Home Rule Bill, upon this preponderance when you hear from those who have the responsibility of filling those posts that one reason, and a main reason, why that preponderance remains is that Roman Catholics have not had a fair chance to acquire the higher education."

(*f.*) There is, however, an additional reason in my mind of much moment, which has not been the subject of much examination at this Commission, but which was incidentally brought out by some questions of Mr. Justice Madden. I refer to the necessity for constituting a register of teachers of Secondary Schools in Ireland, similar to that contemplated for England by the Act 62nd and 63rd Vic., cap. 33, section 4. To any person really interested in the matter of the education of Ireland, it is impossible to exaggerate the importance of this matter. There is now, or shortly will be, a register in England. We have no register in Ireland. Our fear is that, if that state of facts continues, teachers in England who are without such a qualification as will entitle them to be upon the register there, will come over to Ireland, and will flood our educational establishments, and if so, the result will be absolutely disastrous. A proposal to establish a similar register in Ireland was made to the Government during the passage of the Bill in 1899, and it is only fair to the Government to say that, as far as my knowledge goes, it was not by reason of the Government not foreseeing the difficulty that I have mentioned, nor by reason of the absence of any wish to prevent it, that in 1899 a provision to the same effect was not made for Ireland. The proposal was submitted by the Government to the Board of Intermediate Education in Ireland, of which Mr. Justice Madden and I then happened to be members, and that Board did not advise analogous legislation for Ireland. My reason, and that of some of my colleagues, for adopting that course was because the provision for the higher education of Roman Catholics there was insufficient to enable the teachers of Catholic schools to have their qualifications as teachers tested and vouched by a University degree. We thought—at least some of the Board thought—that if there were such a register, it should be based upon there being equal opportunities for the teachers of both religions to prove their right to be upon the register. As it was impossible that the keeper of the register could himself inquire into the qualifications, or do more than see what qualifications had been obtained from other teaching bodies, there was, as matters then stood, and as they now stand, an absolute impossibility to put Roman Catholic teachers, no matter how eminent their qualifications might be, upon a footing of equality with the Protestant teachers, who are enabled to appeal to their University to stamp and guarantee their qualifications by a degree.

6473. Forgive me for interposing a question, just for the purpose of clearing my mind. For the Roman Catholic teachers of whom you are speaking, would it not be to some extent sufficient to have the degree of the Royal University?—But, my lord, we do not consider that the Royal University is a University at all. My own view is that it is merely an examining body, and nothing more. I have the old-fashioned idea of a University that I acquired when I was in that venerable institution, Trinity College, of which I am as fond, and which I am as anxious to support, as the eminent Provost of it can be. I learned there to consider that you can have no true University unless it is a teaching body, and that the examination in a University was, at least as far as the Pass examination was concerned, a secondary consideration, for the purpose of testing whether the primary consideration and intention of the institution had been carried out. The function of a University is to teach; and, subsequently, when you think you have taught, to test by your examination whether you really have successfully taught. Perhaps, I ought, my lord, to have put it more clearly in the remarks I have hitherto made; but my objection, and the objection I had, when the matter was before the Intermediate Board, applied to the fact of there being no teaching University, no real University, to which the Roman Catholic teachers could resort, not only to have their knowledge tested, but to acquire their knowledge. I am one of those who think that a teacher of youth requires a very large amount of training and a very special training. I am myself aware that, unfortunately, in Ireland it is the habit amongst many Roman Catholic circles to think that, because a young man has mastered a particular subject so as to pass a brilliant examination in it, therefore he is in a position to teach that subject to others. According to my own experience, that opinion is eminently fallacious. The ability to acquire knowledge, and the ability, when that knowledge is acquired, to impart it to others, are wholly different matters, and require, in my mind, the training of different faculties of the mind.

6474. I quite agree; and I am sure the Commission generally would agree with your view as to what is a true University. You will forgive me for wanting to get the point cleared up, because you were stating that

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the Board of Intermediate Education in Ireland felt that they could not put Roman Catholic teachers on an equality with others because they could not obtain a University degree, as I understand?—Yes.

6475. I have always understood—and I believe the Commission have been led to understand, that the standard of the Royal University, so far as examination is concerned, is a very high standard; and I wanted to be clear how it was that Roman Catholic teachers could not be put upon the register, even though they might have taken a degree of the high standard of the Royal University?—There is no examination in Pedagogy in the Royal University. The late Mr. George Francis FitzGerald, who was an eminent Fellow of Trinity College, Dublin, took a good deal of interest in the matter, and I think that, to a certain extent, within the last three or four years, a School of Pedagogy has been instituted in Dublin University.

6476. Dr. STARKIE.—Also in the Royal University?—Quite lately.

6477. Yes?—I took part myself in instituting it.

6478. Viscount RIDLEY.—There is no such thing in Oxford or Cambridge?—No.

6479. Dr. STARKIE.—But unfortunately, there are practically no students of it in Ireland, as you know?—I am quite aware of that; unfortunately, teachers in Ireland will do as little as they possibly can. They will not do this until it becomes absolutely necessary that they should do it; but the very moment that a register is established—and it can be established when there are equal facilities for both parties to obtain University degrees—you will find that every teacher who pretends to any degree of eminence in his office will at once take measures to have his teaching knowledge, his teaching power, stamped by a University degree. Might I remark, my lord, that this explanation has arisen from the advantage I have derived from your lordship being kind enough to put a question to me. It illustrates the reasons of the wish that I had at first: that my examination might proceed by question and answer; and I trust that if in anything I say it occurs to you to ask a question you will ask me at once, instead of deferring it to a later period.

6480. Viscount RIDLEY.—I am glad that you forgive my interruption?—I am extremely obliged to you for putting the question. I proceed now to the second head of my evidence:—

"IF THERE BE SUCH NEED, WHAT SHOULD THAT ADDITIONAL PROVISION BE?"

I entertain a strong opinion that the ideal solution of this question would be the foundation of a College, with such an endowment as I shall later on mention, which should be within the University of Dublin, and which should be as Roman Catholic as Trinity College is Protestant. By "within the University of Dublin," I do not mean (as I observe some people have imagined that expression to convey), that the buildings of the new College should be in the park of Trinity College; but I mean that the new College should be affiliated with, and be a constituent College of, that University of Dublin—I believe the technical expression is, "a member" of the University of Dublin—just as Christ Church and Balliol are both Colleges of the University of Oxford. I understand that the Commission have ruled that it is not within their competence to recommend this solution, and, of course, I bow to that ruling; but I deem it due to myself that no misapprehension shall arise in the public mind, from reading my evidence when published, as to my real views. As I think this solution the ideal one, I trust that I may be permitted, in a few words, to state some of my reasons for arriving at this conclusion.

First amongst them I place its necessary effect, viz., the drawing more closely together, the bringing into terms of more familiar friendship, University students of all religious denominations. I wish, as far as in me lies, to extinguish all religious animosity, and to do everything that will tend to accomplish that, in my mind, most desirable object. Contrasting the relations at present existing between the Roman Catholic and Protestant denominations, I regret to be obliged to state, from my own personal experience, that they are not as cordial as they were some fifty years ago. In my view the most effectual remedy for this most deplorable state of things would be the solution I have suggested. Were it adopted, I should hope that, upon many subjects—shall I say upon all subjects, with the exception of Moral Philosophy, History, Biology, and, perhaps, one other subject—lectures, at least for the Honour classes, delivered by University Professors, would be attended by students of both Colleges: that in University examinations common to both Colleges, students would test their intellectual strength; that they would join in their games and athletic amusements; and thus learn by acquaintance with each other, as I think they would, that the warmest feelings of friendship, and sentiments of the highest respect and esteem, can be entertained for each other by persons of the strongest religious views, although they belong to different denominations.

My second reason has for its basis the pride which, as a graduate of the University of Dublin, I take in that venerable institution. I join issue with those who suggest that the title to its prestige is confined to those of any particular religious denomination, or to those whose ideal of a University is that it must be neutral as to religion. When Trinity College and the University of Dublin were established, the entrance to them was by one portal only. The then policy of the State insisted upon University Education being accompanied by instruction in the religion of the State. But the principle underlying this has for upwards of a century ceased to govern. As the Archbishop of Dublin, in his work on University Education has pointed out, the Catholic Relief Act of 1793 (33 Geo. III., Irish, Cap. 21, Sec. 7) enabled Roman Catholics to take degrees and hold Professorships in a University College, subject, however, to two conditions: first, that the College should be thereafter founded, thus excluding Trinity College; and secondly, that it should be a member of the University. Therefore, the provision then contemplated for the education of Roman Catholics was a College in the University of Dublin, not being Trinity College. In other words, it was a recognition of the very matter upon which I would wish to insist, provided it were open, which, unfortunately, it is not. As no such College has ever been founded, this portion of the section has not had effective operation; but this section shows that the Irish Legislature then intended that the University of Dublin should be extended to a second College, and that its intention was defeated only by want of executive action. Of course, if we remember that that Act of Parliament was passed in the reign of George III. it is not necessary to ask why it was that there was no action on the part of the Executive Government. All this, however, is now ancient history. The College and the University are now open on equal terms to Protestants, to Roman Catholics, to Agnostics, and to all others; and I shall hereafter endeavour to show that the characteristic of a University College, that at least it may be a place of religion, as well as of education, learning, and research, still continues. If it does the title of a young Irishman to the privileges of this University must exist, irrespective of the particular religion which, in his College, is associated with education, research, and learning.

My third reason is that it would be the most effective way of keeping up to a high standard the level of University Education in Ireland. May I here remark that I have no sympathy with those who seek to reduce that standard. I plead guilty to being one of that Standing Committee against whom I see a charge was made before this Commission of wishing to uphold the standard of education fixed by the Royal University. I am unwilling to reduce that standard, either in Arts or in any special study, such as Medicine, by reason solely of some other University in another country, or some examining body affording an opportunity of obtaining a degree or diploma upon easier terms. I do not understand the principle of a University or examining body endeavouring to compete in cheapness.

The only other satisfactory solution of the University question, in my opinion, will be the foundation, not of a new College affiliated to the Royal University, but of

A NEW UNIVERSITY, WITH WHICH THAT NEW COLLEGE AND OTHERS SHALL BE AFFILIATED.

I pass over the objection made by some witnesses that this would be an undue multiplication of Universities. Such an objection hardly lies with those who object to the extension of the University of Dublin—it certainly does not apply to me, who am an advocate of that extension—and I come to the affirmative reasons in support of my suggestion. The principal of the many reasons for which I advocate it are four:—

(1.) Because the alternative solution—a College affiliated with the Royal University—would not ensure finality.

(2.) Because that alternative solution affords no opportunity of affiliating to a University the College of Maynooth

(3.) Because it is expedient that the whole responsibility of initiating and developing the new scheme should be thrown upon the Roman Catholics, who demand it.

(4.) Because it is practically impossible to effectively initiate and develop it, unless the persons to be responsible for it shall be absolutely free and untrammelled.

I. THE ALTERNATIVE SOLUTION WOULD NOT ENSURE FINALITY.

This, in my mind, is a matter of supreme moment. Unfortunately, I can personally speak to an agitation upon this question for forty-six years, involving all the bitterness of religious and sectarian controversy. I can speak to it from the year 1855, when my attention was first attracted to the necessity of improvement in University Education for Roman Catholics. I attach as little importance as does anyone to an agitation for which there is no just cause—of which, parenthetically I may observe, we have too much in Ireland—but I hold that there is just cause for the efforts in which the Roman Catholics have during that period persevered to obtain that which I respectfully submit they were, and are, entitled to: equality with their other fellow-subjects in Ireland in relation to University Education.

If they obtain such a College, affiliated to the Royal University, as is suggested in the course of the evidence, they will undoubtedly have obtained a boon—I am the last to deny that, and the last to minimise its significance—but they will not have obtained what they have asked for, what, in my opinion, they have justly asked for, and what they continue to insist they are entitled to—if indeed they are entitled to anything—religious equality. Their grievance, therefore, will continue unredressed, and any one who knows the Irish character as I know it can state for certain that that agitation will continue.

It is now twenty-eight years since, in 1873, the Prime Minister and his colleagues—at a time when I was a member of the Government as Attorney-General for Ireland—considered the Irish University question, and propounded Mr. Gladstone's famous University Bill of 1873. The advice of those who knew the views of Roman Catholics of that day, who realised how fully they were convinced of the justice of their claim, and how determined they were to persist in it until they had achieved success, was disregarded; and in result now, at the end of twenty-eight years, the same identical question is being considered by this Commission, whilst the continuing agitation has, during the entire intervening period, harassed the country and divided friend from friend. My conviction is that if equality be not now attained, we shall undoubtedly have a still further continuance of the agitation. How long it shall continue who shall tell?

II. THE ALTERNATIVE SOLUTION AFFORDS NO OPPORTUNITY OF AFFILIATING TO A UNIVERSITY THE COLLEGE OF MAYNOOTH.

I have already stated my desire for a closer drawing together amongst University students of different religious denominations. I have now to add that personally I am equally desirous of closer association in University life between ecclesiastical and lay students. There are few Roman Catholic gentlemen who do not regret that their habits of thought and those of the Roman Catholic priesthood are not more closely coincident. In saying this I do not intend to make the slightest imputation upon either class—either upon the Roman Catholic clergy or upon the Roman Catholic laity; but I hold that each class would be improved by being more closely associated with the other, by both being associated together as they are in many continental countries—for instance, in the University of Bonn—by fighting out, if I may use the expression, in a University their differences of opinion in early youth, and coming, as University men usually do, to an agreement upon many matters which lie at the basis of their common daily lives; and to a toleration of, and respect for, the views of others, conscientiously entertained.

The normal course of a student in the College of Maynooth is seven years. Of these the first three are devoted to the study of Classics, Mathematics, Natural Philosophy, and other non-ecclesiastical subjects. During the remaining four years the studies are almost exclusively theological. I think it undoubted that the most brilliant of the Maynooth students will compete for the prizes and Scholarships in the new University; and I should hope that, speaking generally, the benefits of it will be availed of—at least, to some extent—by all the students of that College. For the first three years of their course they could be resident in Dublin during the College sessions in the same way as are the ordinary lay students, possibly in a separate establishment of their own, regulated by the authorities of their Church, as, I understand, is the case with the German Roman Catholic ecclesiastical students in the University of Bonn. At the end of this period, during the fourth year of their course—that is, when they commence the study of Theology in Maynooth, they might continue the reading of their Arts course, which, probably, would be mainly Moral Philosophy, until they obtained their B.A. degrees; and if, during the succeeding three years, during their course of Theology the study of Moral Philosophy was continued, as it not only probably, but I may say almost necessarily would be, in consequence of the close connection between the two studies, they would be ripe to obtain the degree of Master of Arts shortly after ordination.

III. THE RESPONSIBILITY OF CARRYING SCHEME INTO EFFECT TO BE ON THE ROMAN CATHOLICS.

Thirdly, as a matter of State policy, if further provision be made for the higher education of Roman Catholics, I suggest that the responsibility of initiating and carrying into effect whatever scheme may be laid down shall be left to the Roman Catholics who demand it. We all hope that whatever the scheme may be, it may have the success which is contemplated for it by its originators. But it may to a certain extent fail. Few things that are the work of human hands entirely answer the expectations of their founders. Every such foundation as a College will require not only the closest attention to its working, but constant alterations of its statutes and bye-laws, so as to remedy from time to time the defects which must inevitably become apparent. In all this, I suggest that the Roman Catholics ought to be left untrammelled.

IV. IMPOSSIBILITY OF CARRYING OUT SCHEME UNLESS THE ROMAN CATHOLICS ARE LEFT UNTRAMMELLED.

But if the new College is to be affiliated to the Royal University, and if its connection with it is to be a reality, as distinguished from a mere name, the Senate of that University must have, and if they have, ought to exercise, a controlling power over the College in respect of the very matters as to which I suggest the College should be untrammelled.

This brings me to the consideration of the character of the body—the Senate of the Royal University—in which such control over the new College as is usually exercised by a University over its Colleges would be vested, supposing the proposal is adopted of affiliating the new College to the Royal University. I need not say that my remarks upon this subject are intended to be wholly impersonal. I am myself a member of that Senate, and I have always been impressed with the manifest desire of every member of it to act not only as he conceived best in the interests of the University, but with absolute fairness to every College and to every student. But what are the principles upon which this Royal University is founded, and upon which presumably it would act, and ought to act, towards the new College? I take it they are two:—

(1.) The principle upon which the Queen's University and Queen's Colleges were founded, or perhaps I should say (for I do not wish to enter upon a controversy upon this point) upon which they were administered, of education being unaccompanied by religion; and

(2.) The principle introduced by the Act which established the Royal University, that a mere Examining Board truly answers the description of a University.

These are the principles of the Royal University; the principles that the Senate of the Royal University was called into existence to promote; and they are in direct antagonism to the principles which, in my opinion, would govern the new College, if it were established. There religion would, to a certain extent—the exact amount of that extent I shall afterwards point out—accompany education. There the ideal which would be aimed at would be the true educational culture of a gentleman, not the readiness in answering that is learned from a crammer. Observe, then, the questions that, in relation to the new College, would have to be determined by the Senate of a University founded upon the principles of the Royal:—

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To what extent should residence be necessary in the College? Should attendance at lectures, and if so, for what period, be an essential condition to obtaining a degree? If essential, should this principle be introduced tentatively and gradually, or at the very institution of the College? To what extent should examination be relied on as a test of knowledge?

Many other such questions might be enumerated. Now, would it be reasonable to ask the Roman Catholics to submit to the judgment and decision, upon such questions as these, upon which the future of their College would so eminently depend, of an institution founded on principles absolutely antagonistic to those which they intend to adopt? It may be said that the principles of the Royal University may be changed. I see great difficulty in effecting such a change, so long as the College of Belfast shall be affiliated to it. And then the affiliation of the new College to this University would be but the commencement of a long period of unrest, of anticipated change, of anxiety for the future, of an utter absence of stability. That the College of Belfast will within a period, either long or short, become a constituent College of a Northern University is, to my mind, a certainty; aye, and that the demand for it (if a University be founded for the Roman Catholics) will be instantaneous upon the Charter for that University being granted, no one who has any knowledge of the North of Ireland can doubt. One can read through the lines of the evidence of Dr. Hamilton and Dr. Whitla that this is their opinion, and I cordially concur in it. Are we, then, to affiliate with the Royal University for a temporary and undefined period, this new College, with the certain anticipation that a change in the near future would be inevitable, an anticipation fatal to the calm and rest essential to a College, especially to a new foundation.

I come now to the third head of my evidence.

"THE CHARACTER OF THE PROPOSED UNIVERSITY AND COLLEGE."

The first essential condition will be that each shall be subject to the Tests Act, in the broadest sense. I am not about to read the long sections in the Acts of 1871 and 1873, abolishing tests; but to show that I have no desire to minimise or fritter away these conditions, I shall take the liberty of quoting and adopting another passage from the speech of Mr. Morley, to which I have already referred, which shows in popular language all that is involved in this abolition of tests. Mr. Morley said*:—

> "There are certain general conditions which I should make before I assented to any scheme—conditions with which, I think, the right hon. gentleman would agree. The first is that there is to be no test as to any Chair, excepting, of course, a Theological Chair, which would not come out of the public funds." Then, later on—"My second condition is that no test shall be imposed upon any student, and nobody who desires to attend lectures or experiments in laboratories or elsewhere shall be shut out because he does not belong to the Roman Catholic religion. . . . The third condition is that no student, on the mere ground of his religious convictions or creed, shall be shut out from competing for prizes; and the fourth condition is that there is no endowment of any Theological Chair out of the public funds."

In the Universities of Oxford and Cambridge tests sary to commence by stating my idea of the character of a University, or of a University College, in reference to religion. In the view I take I am happy to be able to say that I conceive I am in unison with the opinions of the majority of the Church of England, of the Protestant Episcopal Church of Ireland, and of the authorities of the Universities of Oxford, Cambridge, and Dublin. I hold—and I believe that they hold—that true University Education need not necessarily be neutral as regards religion—that it cannot be altogether divorced from religion.

In the Universities of Oxford and Cambridge tests were abolished in 1871, by the Act 34th Vic., cap. 26. The true meaning, however, of that statute is, to my mind, somewhat overlooked in some quarters in this country. That meaning is apparent from its recitals.

> "It is expedient that the benefits of the Universities of Oxford, Cambridge, and Durham, and of the Colleges and Halls now subsisting therein as places of *religion* and learning, should be rendered freely accessible to the nation."

That is, not that it is expedient that, for the future, religion shall have no place in the teaching of the Universities in Oxford and Cambridge, but that they shall continue, as they have heretofore been, places of religion and learning, and that, retaining that character, the benefits of them shall be accessible to all classes of the community—of course, as far as is possible, consistently with the faith of the students not being interfered with. It then recites:—

> "And whereas by means of divers restrictions, tests, and disabilities, many of Her Majesty's subjects are debarred from the full enjoyment of the same; and whereas it is expedient that such restrictions, tests, and disabilities should be removed"—

Mark, now, these words—

> "Under proper safeguards for the maintenance of religious instruction and worship in the said Universities, and the Colleges and Halls now subsisting within the same."

Two matters are pointedly called attention to by this recital. First, that it is expedient that, by the abolition of tests, all persons shall be at liberty to partake of the advantages of these Universities. Second, that this abolition is not to be absolute, but *sub modo* only, so far as that can be done under proper safeguards for the maintenance of religious instruction and worship. Let us see, now, how the Legislature proceeded to carry their intentions into effect. Tests having been fully abolished by the preceding sections, with which I need not trouble the Commission, Section 4 of the Act is as follows:—

> "Nothing in this Act shall interfere with or affect, any further or otherwise than is hereby expressly enacted"—that is, as is necessarily involved by the abolition of tests—"the system of religious instruction, worship, and discipline which now is, or which may hereafter be, lawfully established, in the said Universities respectively, or in the Colleges thereof, ... or the statutes and ordinances of the said Universities and Colleges respectively, relating to such instruction, worship, and discipline."

Section 5 enacts that—

> "The governing body of every College subsisting at the time of the passing of this Act in any of the said Universities shall provide religious instruction for all members thereof *in statu pupillari* belonging to the Established Church."

Section 6 enacts that morning and evening prayer, according to the order of the Book of Common Prayer, shall continue to be used daily as heretofore in the chapel of every College subsisting at the time of the passing of the Act in any of the said Universities, but authorises the use of certain abridgements of those prayers. Section 7 contains the Conscience Clause, but it is to be observed that it is framed so as to dispense with attendance upon a lecture, not to qualify the character of the lecture:—

> "(7.) No person shall be required to attend any College or University lecture to which he, if he be of full age, or if he be not of full age, his parent or guardian, shall object upon religious grounds."

A further Act respecting the Universities of Oxford and Cambridge, was, as the Commission is aware, passed in 1877 (40 & 41 Vic., cap. 48). By it Commissioners were constituted, who were empowered to make statutes as to these Universities and their Colleges and Halls. These statutes were to be submitted to Her Majesty in Council. By the 15th section of the Act it is enacted that the Commissioners, in making a statute for a University or a College or Hall "shall have regard to the interests of education, *religion*, learning, and research." Section 59 enacts that the Commissioners, in statutes made by them, shall make provision, as far as may appear to them requisite, for the due fulfilment of the requisitions of Sections 5 and 6 of the Act of 1871, relating to religious instruction and to morning and evening prayer in Colleges. Those are the sections I have already referred to. I need not remind the Commission of the numerous statutes which

* Parliamentary Debates, vol. liii., cols. 929-930.

were made under this authority, and submitted to and approved by her late Majesty in Council. They are collected in two volumes, one of which (that relating to the University of Oxford and its Colleges and Halls) was published by authority in Michaelmas Term, 1882, and the other (relating to Cambridge) in October, 1883. All these statutes make provision for Divine Service and religious instruction.

I come now to the University of Dublin. Tests, in the University of Dublin, were abolished in the year 1873, by the Act 36 Vic., cap. 21. The recital of that Act is that, "It is expedient that the benefits of Trinity College and the University of Dublin, and of the schools in the said University"—I call attention to these words as I did in the Act relating to Oxford and Cambridge—"as places of *religion* and learning, should be rendered freely accessible to the nation." This statute, it will be observed, does not, as does that of 1871, contain a recital in reference to safeguards for the maintenance of religious instruction; nor are there any sections similar to the 4th, 5th, and 7th of the former Act. But, of these sections, the 7th was unnecessary, as, according to the statutes of Trinity College, attendance at lectures was not an essential condition—as it was at Oxford and Cambridge—to obtaining degrees in Arts; and as to sections 5 and 6, although, in consequence of no equivalent provisions being contained in the Irish Act—I mean in the Act of 1873—it is not now obligatory upon Trinity College to provide religious instruction, or to make provision as theretofore for morning and evening prayer and Divine Service in the chapel of the College, the regulations of the College make provisions to the same effect. I refer to page 23 of the Dublin University Calendar for the present year:—

> "ATTENDANCE ON DIVINE SERVICE."
> "All students who are members of the Churches of Ireland or England, and who reside within a distance of one mile and one-half from the College, are required to attend Divine Service in the College Chapel, both on Sundays and week-days";

and provision is made for the names of such students as are negligent in their attendance being brought under the notice of the Provost or Senior Dean. Students resident within the College who persistently neglect to comply with these regulations are rendered liable to be deprived of their rooms. Students in residence, who are members of the Presbyterian Church in Ireland, are required to lodge with the Junior Dean a certificate of attendance at one of the Presbyterian Churches in the city, signed by the minister of that Church.

The regulations as to religious instruction are to be found at page 66 of the Calendar, under the heading "Catechetical Course." Students who are members of the Churches of Ireland or England, or of the Presbyterian Church, are required to keep catechetical terms; and catechetical examinations are to be held at the beginning of each term, immediately after the Term examination, for the benefit of those students who have not been resident during the preceding term.

From the statutes and regulations I have referred to, I deduce two propositions:—

(1.) That, to the present, so far from religion being divorced from University teaching, the Legislature, in respect of the Oxford and Cambridge Universities, has recognised the necessity of religion accompanying University teaching, and has made it obligatory upon the Universities and Colleges that they shall continue it, so far as is possible, without interfering with the religious belief of the students.

(2.) That the only difference between the Universities of Oxford and Cambridge on the one hand, and that of Dublin on the other, is that in Dublin the same necessity is recognised and the same obligation imposed; but they are so recognised and imposed by the University regulations, and not by Act of Parliament.

Passing now from the character of these Universities, and in aid of my suggestion that the new University and new College should have what I may call a certain religious tinge, I wish to refer shortly to the history of Ireland in reference to education for the last three-quarters of a century, for the purpose of showing that any reasonable man ought to be convinced that a University founded in Ireland upon any other principle will not be attended by the majority of such Roman Catholics as are fit for University Education; in other words, that it will not accomplish its purpose.

That history shows that it is difficult, if not impossible, to maintain in Ireland for Roman Catholic youth—and indeed I may add for either Episcopalian Protestants or Presbyterians—an institution for secular learning in which there is not a strong element of denominationalism. I am able to speak upon this subject with a certain amount of knowledge, because since the year 1890 I have been a member of the National Board of Education, which is charged with the superintendence of Primary Education in Ireland; from 1878, when the Board of Intermediate Education in Ireland, which is charged to a certain extent with the superintendence of Secondary Education in Ireland, was established, I have been a member of that Board; and for the last ten years I have been one of the Senate of the Royal University, and a member of its Standing Committee.

First, then, as to Primary Education. When I became a member of the National Board in 1890, a Board which was founded in 1832, for the express purpose of affording to the poorer classes united secular with separate religious instruction, I found that the practice of the Board, which had been enforced by rules approved by successive Chief Secretaries, had become largely denominational. Now, if Lord Stanley's letter, under which this Board was established, be closely considered—it is published in many reports of the National Education Board; Dr. Starkie will be able to refer the Commission to it—it will be found that it is the very incarnation of the principle of undenominationalism. That was in 1832. Now, what was the state of facts that I speak to, of my own personal knowledge, in the year 1890? I have obtained returns from one of the Secretaries of the Board, in order that I might be certain of my data, although personally I was aware of this before I received these returns, and the returns are at the disposal of the Commission.

I take the year ending 31st December, 1889. Out of 8,251 National schools then in operation, 3,363 were under Roman Catholic teachers, and were attended exclusively by Roman Catholic students; and 940 schools were under Protestant managers, and were attended exclusively by Protestant students. These two figures amount to 4,303, or over 52 per cent. of the entire, whilst the number of schools in which there was a mixed attendance of Roman Catholic and Protestant students amounted to 3,948, or under 48 per cent. of the entire. That was a fact known not merely to the members of the National Board; for the figures are mentioned in the report that they presented to Parliament for the year ending December 31st, 1889, and all through the period of which I am speaking the figures in relation to the number of schools of the class that I am now referring to, and the distinction between these classes of schools, are mentioned in the reports presented to Parliament.

I also found when I joined the Board in 1890 that the percentage of schools attended by students of one denomination exclusively had, during the then recent years, rapidly increased, and was then continuing to increase. I found that rules had been made by the Board, with the sanction of Chief Secretaries and the Treasury, which imposed a greater burden on the nation, whereby aid was authorised to schools having a daily attendance under that ordinarily deemed the minimum, if the means of religious instruction were not attainable by children of a particular religious denomination in any State school within reasonable distance from their homes. That is a rule that during my time was almost daily acted upon; we are acting upon it at present, and I may say that the main action taken under it at present is, to grant aid to small Protestant schools in districts in which there is sufficient accommodation for them in schools under Roman Catholic managers. The reason that aid is given to schools of that class is that there has been a recognition, not by the Board alone—I wish to impress this upon the Commission—but by the Board acting under the direction of Chief Secretaries and the Treasury—that in relation to small classes of children that have no school provision for their religious instruction within the immediate neighbourhood, an exception should be made, although that exception imposes a greater burden upon the public. Again, at the time I refer to—1890—nearly all the managers of schools, whether Roman Catholic, Protestant-Episcopalian, or Presbyterian, were ecclesiastics. Further, denominational Training Colleges were in operation, a large portion of the expenses of which was provided by the State. Thus the force of

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circumstances in less than sixty years had changed the purely mixed system of education, which was intended to be established by Lord Stanley's letter, to one which was in fact denominational, although by reason of the mixed form being preserved, many of the real benefits of the denominational element were excluded. Were it worth while to call attention to the figures which appear in the Report for 1900, they would show that this tendency to denominationalism has still further increased, the schools in which the attendance is exclusively of students of one denomination having increased by upwards of 20 per cent., whilst the increase in the total number of schools was not more than 5 per cent. The decrease of schools having a mixed attendance was something between 18 and 20 per cent.; I have not the exact figures; I made a calculation, but unfortunately I have mislaid it; but the figures are in the report. Further, during this period the State had undertaken the entire expense of the Denominational Training Colleges and placed them in a position exactly co-ordinate with that of the Commissioners' own undenominational Colleges.

I now pass from Primary Education, having shown from what I have mentioned, that the force of circumstances has changed the undenominational system intended to be established to one practically denominational, and I come to Secondary Education.

As one of the Commissioners of Intermediate Education from the foundation of the Board in 1878, I have had for the last twenty-three years to take part in the administration of a system avowedly intended to partially endow schools, whether denominational or mixed. I am personally aware that the Conscience Clause which is contained in Section 7 of the Intermediate Education (Ireland) Act, 1878 (41 and 42 Vic., cap. 66), was purposely framed to enable the most strictly denominational schools to obtain the benefit of the grant. The section is as follows:—

> "The Board shall not make any payment to the managers of any school unless it be shown to the satisfaction of the Board that no pupil attending such school is permitted to remain in attendance during the time of any religious instruction which the parents or guardians of such pupil shall not have sanctioned, and that the time for giving such religious instruction is so fixed that no pupil not remaining in attendance is excluded directly or indirectly from the advantages of the secular education given in the school."

I need not say that this clause has no effective operation whatsoever in any school which is strictly denominational, as are practically all the schools in Ireland. Take the school at which I myself was when a boy—Clongowes Wood College—a boarding school with, I think, between 200 and 300 students at present. They are all Roman Catholics. No one would be admitted into the school who was not a Roman Catholic. That clause can have no application to it at all. No matter to what extent religion is mixed up with the secular teaching at Clongowes Wood College, the managers are able to sign a declaration to the effect that the Intermediate Education Commissioners require; and that Intermediate Education Board is bound to give them the aid provided by the Act, although they know—for there is no secret about it at all—that it is a strictly denominational College.

Now, as to University Education. As regards University Education, the scheme of the Queen's Colleges, devised by Sir Robert Peel with the best intentions, is shown by the experience of half a century to have been, and now admittedly is, an absolute failure as far as Roman Catholics are concerned.

Relying, then, upon the principle which I have gathered from the Oxford, Cambridge, and Dublin Acts, that both Universities and Colleges should be places as well of religion as of education, learning, and research, and on the proved impossibility of a College of any other type being availed of by Roman Catholic youth in Ireland, I am of opinion that the College which it is proposed to found should, in reference to religion, be similar in character to Trinity College, with the exception that the religion of the place, instead of being Episcopalian-Protestant, as it is in Trinity College, should be Roman Catholic. The College should be open upon equal terms to persons of all religions, and to persons of no religion, and the statute creating it should contain provisions to that effect, and a Conscience Clause and other provisions in the words of those contained in the Oxford and Cambridge Tests Act of 1871.

The next question is the vital one of the stability in office of the University Professors. The observations I have to make in reference to it will apply equally to that of the office of Fellow of the College, although necessarily the term of the latter office will be of shorter duration.

I desire, as preliminary to these observations, to mention that in all I shall say under this head my sole object is to endeavour to preserve sufficient safeguards against the teaching by a Professor or Fellow in his capacity as such of false doctrine, or of doctrine forbidden by the Roman Catholic Church. When it is known that every Roman Catholic is bound, under penalty of ceasing to belong to the Church, to believe everything that the Church proposes to his belief, this cannot be deemed to be an unreasonable object. It is certain that the accomplishment of this object is, and must for ever be, deemed absolutely essential by Roman Catholics. A Roman Catholic parent sending his son to a University does not, once that son has entered, trouble himself much with the religion of his child. He is resident far away from him; he has no opportunity of watching his daily actions; the paternal office of seeing that he adheres to the practice of his religion, and is clearly instructed in its principles, can no longer be fulfilled by him. That, in my view, is entrusted, and rightly entrusted, as it is in Oxford, Cambridge, and Dublin, in respect of the students of the religion of those Universities, to the teachers, and Professors, and the authorities of the College.

Whilst, then, I propose absolute security of tenure for the Professors, I do so upon the condition which I deem to be inherent in the character of a Professor of a University or a College which is to have the religious tinge I have suggested—that they shall refrain from availing themselves of their opportunity of teaching to teach anything which is contrary to the doctrine of the Church of that religion with which the University or College is tinged.

In my opinion the Professors of the University should be appointed for life, or during good behaviour, and the Fellows of the College for a defined term of years, and of course each should be liable to be called upon to resign (and in case of refusal to be deprived of his office) in the event of his becoming incapable by age or infirmity. I suppose that in the case of Professors there would be a just and proper provision made for pension in the event of their being obliged to resign for that reason.

There should also be a statute applicable to both Professors and Fellows, similar in character to one which has been long in force in many, if not in all, of the Oxford Colleges, and which is as follows. I quote from No. 30 of the statutes of Balliol College, which I have with me. I may say that I have looked through this volume of the statutes of the various Colleges in Oxford, and I have not been able to find one in which there has not been a substantially similar provision. But as I have not been able to look through all of them in the short time at my disposal, I am not able to pledge myself to that effect. Statute 30 of Balliol contains these words:—

> "If a Fellow be guilty of grave immorality or misconduct, or of contumacious disobedience to any of the statutes or bye-laws of the University in force for the time being, or become bankrupt, or make any statutory composition or arrangement with his creditors, he may be deprived of his Fellowship by the Visitor, after due enquiry held . . ."

It can, I think, hardly be denied that there should further be statutes providing that a Professor or a Fellow shall not in any lecture or examination, or in the discharge of any other part of his professorial or Fellowship duties, or, under colour of his office, teach or advance any doctrine or make any statement contrary to the doctrine of the Roman Catholic Church, or the teaching of which has been forbidden by that Church.

I have before me Section 8 of Chapter 5 of the statutes of the Queen's Colleges, made by the Queen's College Patent of the 11th December, 13th Victoria, which provides that if any Professor in any lecture or examination, or in the discharge of any other part of his collegiate duties, teaches or advances any doctrine, or makes any statement derogatory to the truths of re-

vealed religion, he shall be formally warned and reprimanded by the President, and in case of repetition his removal is to be recommended to the Crown. That deals with the principles of revealed religion—words rightly applicable to such a College as was there in question, which was neutral as regards the religion of the various denominations of Christians.

I have endeavoured to adapt that to the case of a University which is not neutral, but which has a certain tinge of religion: that is, to bring me back to my text, the same tinge of religion in respect of Roman Catholicism as there is in Oxford, or Cambridge, or Dublin in respect of Protestantism. In adapting the words of the statute, I have added, for the sake of precaution and accuracy, the words "under colour of his office"—"shall not teach or advance in any lecture or examination, or under colour of his office," &c. Those words "under colour of his office" do not occur in the Queen's College statute, and I have used them for the reason that, according to our legal conception, the words "*colore officii*" express better than "*virtute officii*" the character of an act which one is, by his office, afforded an opportunity of doing, but which still is in excess of his official duty. "*Virtute officii*" carries with it to a certain extent the idea that the act is one which is justified by virtue of the office; "*colore officii*" points more to an act of misfeasance in that office, as distinguished from one in performance of the duty of the office. Now I shall proceed. For the words "derogatory to the truths of revealed religion," which were appropriate to a College neutral as to religion of the Christian denominations, I have substituted their equivalent in relation to an institution having a tinge of the Roman Catholic religion, viz., "contrary to the doctrine of the Roman Catholic Church, or the teaching of which has been forbidden by that Church."

The next question is, what should be the constitution of the Visitorial Board, which shall determine the guilt or innocence of an impeached Professor. I suggest that it should consist of either six or nine persons—that is, of some number divisible by three—of whom one-third should be Roman Catholic Bishops, the Archbishop of Dublin being one, *ex-officio*, because the seat of the University will be in his diocese, and the other two-thirds laymen. The Bishops, other than the *ex-officio* Visitor, and all the lay Visitors, should be appointed by the Crown for life; the lay Visitors should not necessarily be Roman Catholics, and some of them should be supposed to be eminent in law, as, for instance, those who are, or have been, judges of the Court of Appeal or of the High Court, or Benchers of King's Inns. May I say here that, speaking entirely for myself, I would heartily desire that upon that Visitorial body we had the benefit of some members not of the Roman Catholic creed. I recognise that in reference to University Education the Roman Catholics in Ireland are unhappily somewhat behindhand; and I, for one, would heartily welcome any assistance that we could receive from our brethren of other denominations who have greater University training and knowledge than we have ourselves.

Provision then should be made, by the charter or by the statutes, as to the mode of hearing a charge against a Professor. There are two modes of dealing with a difficulty such as I understand is supposed to exist here, a difficulty which probably will not, but possibly may, arise. One of these modes is to ignore it, to act as if it did not exist—to hope that it will never arise, although possibly it may arise. This mode has, unfortunately, been too often adopted in relation to affairs in Ireland. An example of it would be, to provide in the charter or statutes simply that the charge should be heard by the Visitors, and that the determination of the majority should bind, whether that majority included all, or any, of the Episcopal Visitors.

The weight of the evidence already given to the Commission is that, were this last-mentioned mode adopted, the Roman Catholic lay Visitors would probably adopt the view of the Bishops as to the doctrine of the Church, so that the decision, although nominally one of the Episcopal and lay Visitors, would, so far as it depended on doctrine, be in reality that of the Bishops alone; and, further, nearly all the witnesses who have spoken on this subject are of opinion that if the Bishops were in the minority on the vote they might withdraw the students from the College, and for myself I have no doubt that that would be the necessary result.

Thus, two alternatives are presented; one that the lay Visitors should not as to doctrine exercise any real judgment, or, on the other hand, that the College should be a failure, as have been such of the Queen's Colleges as were set up in Roman Catholic districts of the country, and intended mainly for the Roman Catholic section of the population. I venture very strongly to disapprove of such a frame of the statute, because if the deprivation is in truth and reality to be the act of the Bishops alone, or in an essential part to depend upon their sole act, in my opinion, the statute should be so framed as to show the truth. Were it not so, the unpleasant words that we sometimes hear in legal matters—"*aliud simulatum aliud actum*"—would be applicable to the decision. My view is to call a spade a spade.

No Bishop or no Government would, or could, be a party to such a framing of the statute. Further, it would be unbusinesslike, as the institution built on such a basis would necessarily, and by the admission of the witnesses I have pointed out, be of unstable equilibrium. It is contrary to all business and logic to spend a large sum of money in founding an institution upon such a basis as that.

The other mode of dealing with such a supposed difficulty—the only one by which the University question in Ireland, in my opinion, can be solved, and the one which I suggest as the only one which ought to be considered by this Commission—is to fully appreciate it, to face it, and to inquire whether there is any practical mode of meeting it, of such a character as to be capable of being adopted by this Commission; if so, to adopt it boldly, and if not, to say that the University Question in Ireland cannot be solved at all. When I treat the question as a difficult one, I do not do so because I believe that any difficulty is inherent in it; but although I regret, I must allow for, and appreciate, the jealousy with which many most excellent persons view questions of this nature.

I do not say that there may not be more ways than one of solving the problem. One only, however, has occurred to my mind, and I proceed to state it:—

A charge against a Professor of teaching a doctrine which is alleged to be contrary to that of the Roman Catholic Church may involve four separate questions:

(1.) Whether the matter attributed to him was in fact taught by him;

(2.) Whether such matter was contrary to the doctrine and teaching of the Roman Catholic Church;

(3.) If so, was the Professor's disobedience of the statute in teaching such doctrine contumacious?—for the Commission will remember that in the statute under which a provision of this description will be worked, the Professor is not to be subject to dismissal unless his disobedience of the statute is contumacious;

(4.) If so, what punishment should be awarded? Should he be deprived of his office, or should he be merely admonished?

I propose that three of these four separate questions—the first, third, and fourth—should be determined by all the Visitors, lay as well as episcopal, who hear the charge, and that a majority of the whole body as to these three matters should bind, although all the episcopal Visitors are in a minority. That is, No. 1—Did the man speak the words; (3) if so, was he contumacious in so doing; did he do it after due warning, or did he do it without sufficient consideration; above all, is it his intention to persevere in teaching that doctrine, or, seeing that he has gone wrong, is he willing to submit to the higher authority who has authoritatively determined that it is wrong, when he himself believed it to be right; and (4), and above all, the punishment—for it does not necessarily follow that the punishment should be so severe as deprivation.

Now it will be observed from what I have said that I have left to the judgment of the entire body, lay as well as episcopal, every element in the charge, save that in which the nature and character of the Roman Catholic doctrine comes in—the particular doctrine of the Roman Catholic Church upon the subject. It remains, then, to consider who is to determine No. 2—the question of the doctrine of the Roman Catholic Church in relation to the matter so taught.

To solve this problem, let us take the conditions under which it is set. The University is to be acceptable to Roman Catholics. To attain this object, some Roman Catholic Bishops are, *ex hypothesi*, to be placed on the Visitorial Board. They are to be so placed there, not solely (may I be permitted to say) by reason of any special capacity in the individuals in lay educational matters, but because they are Bishops.

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I put aside, for the present, that which I think could be insisted upon, that the reason of their appointment is, or at least involves, the recognition by the State of the doctrine of the Roman Catholic faith that the Bishops are the teachers of the doctrines of the Church, the supreme authority (subject to appeal to the Pope, which, *quoad* the matter in hand here, is inadmissible), of the Roman Catholic Church to declare its doctrine. For the present, I eliminate this; but at least this remains—that they have knowledge, *ex-officio*, of the doctrines of the Roman Catholic Church, and are appointed by reason of that knowledge.

May I pause here to say that I deem as inadmissible the question of an appeal to the Pope, not because, as a Roman Catholic, I do not to the utmost admit, and bow to, his supreme authority, but I do it for two reasons. First, my idea, as I shall afterwards show, of a University is, that it should be autonomous, should be self-contained, should have its own tribunals, that once and for all, without appeal to a court of law, shall determine all matters in relation to its own discipline and teaching. And I object to an appeal to his Holiness in the same way as those interested in the Universities of Oxford and Cambridge would object to a decision of their Visitors being questioned in an action at law, or on an appeal to the Privy Council. But secondly, I do it for another reason. I am not ignorant of the history of England. I know, as every member of this Commission knows, that the jealousy of the exercise of Papal authority in reference to temporal affairs does not date from Reformation times. I know the statute of Richard II.* and the many earlier statutes upon the subject, which show upon the Statute Book that long prior to the Reformation the English people treated the interference of the Pope in their temporal matters as an act in derogation of the sovereignty of the Crown.

Further, I think that an appeal to the Pope is absolutely unnecessary for the protection of a Professor. In a University with a Roman Catholic tinge in its religion, I should think that the unanimous decision of as many Roman Catholic Bishops as happened to be upon the Board of Visitors (pronounced by them after full inquiry, with an opportunity of the Professor being heard, by himself and an expert in Roman Catholic doctrine and Roman Catholic canon law), ought to be satisfactory to him, and if it is not I think he ought not to be a candidate for a professorship in a College of this description.

It follows, from what I have said, that in relation to the determination of questions of doctrine, the body of Visitors is logically divisible into two categories. Those within one category, that of the Bishops, must be deemed, to know by virtue of the offices in respect of which they have been appointed Visitors, the canon law and the Roman Catholic doctrine as taught by the Roman Catholic Church. They must be deemed to know that law and doctrine, in the same way that I, as a judge, am deemed to know the law I administer. A Bishop, sitting as such to determine a question of Roman Catholic doctrine, in my judgment, can no more hear a witness tendered to him to prove that doctrine than I, sitting in court, can receive evidence from barristers as to the common law upon any particular point which may arise in a case before me.

The case is different with those in the other category, viz., the lay Visitors. They do not know, in fact, nor can they be deemed to know, the canon law, or the doctrine of the Roman Catholic Church. To them it is matter of fact, to be proved, when it becomes material, by witnesses; just as foreign law and Scotch law are, in our courts, proved as matters of fact. It logically follows that unless there be a rule binding one category of Visitors to act on the decision, in this matter, of those within the other category, the entire body cannot sit together to jointly determine this matter at all, as to which some of them cannot hear evidence, whilst the others cannot know anything of the subject, and, therefore, cannot determine, unless they hear evidence. But the joint determination by the entire body is essential in point of law to the validity of a determination under the statute, and therefore, if it cannot be jointly determined it cannot be determined at all.

I need not say to the Chairman, or to Mr. Justice Madden, or to any lawyer, that unless there were some express provision directing the binding decision on part of the charge to be that of part only of the Visitors, there should in law be a single joint decision upon the entire matter. If the Bishops formed their own opinion separately, on their own knowledge of the doctrines of the Roman Catholic Church and the canon law, and if the lay Visitors sat and heard the evidence of experts on the same question, and even if all of them came to the same opinion on the question, the decision would be bad in point of law, because it would be a separate decision of separate parts of one single tribunal.

This argument may be put into another form, under which it may, perhaps, come more home to University men. It is this. The University ought to be autonomous. That it may be so is the basis of the necessity for Visitors. It is their function, as a domestic tribunal, to enforce obedience to the University statutes by determining whether they have been violated, and by, if necessary, imposing punishments, even to the length, when expedient, of depriving the wrong-doer of his University office. To this end this domestic tribunal must be capable of appreciating and understanding each charge brought before it which it has jurisdiction to determine.

A charge that a Professor taught something, not defined in the charge, but alleged to be against the doctrine of the Roman Catholic Church, would not be a sufficient charge at all. The thing taught, which is alleged to have this character, should be stated, so that the tribunal should be able to judge whether, if true, it constituted a violation of the statutes, or, in other words, whether it was a charge which they, as a tribunal, would call on the Professor to answer. The charge must itself set out the specific doctrines alleged to have been taught. Now, suppose a charge to be so framed, it is necessary that the tribunal, before it proceeds to investigate it, should determine whether, if true, it was a breach of the statute; for, if not, then there is no necessity to investigate its truth, and, indeed, it may be doubtful whether, in that case there would be jurisdiction to enter upon it at all. The tribunal must, therefore, *qua* tribunal, know the doctrines of the Roman Catholic Church, and unless there are persons on the Visitorial Board who know those doctrines, there cannot be a determination that the statute has been violated, and the persons who have this knowledge are the only persons who can determine this essential part of the charge.

I have thought this matter out from time to time, and the more I have considered it, with a full appreciation of the difficulty of bringing it home to the English people as a body, with a full appreciation of the objection entertained by many to allow a substantial charge, involving deprivation of an office, to be determined by ecclesiastical members—I have thought it out with, I can assure you, the most honest and anxious determination to find some other method by which the question could be solved, but without success. It is not now, for the first time, that I have thought of it. As long ago as, I think, in the year 1887, there was some talk as to the founding of some Roman Catholic institution.

However it may have been then, I was asked to consider this question, and the opinion I arrived at then is the opinion I have since retained, and do now retain—that the only mode by which this difficulty ultimately can be solved is by providing in the Charter that, in respect of this matter of Roman Catholic doctrine, and of Roman Catholic canon law, when it arises, its determination shall be relegated to the members of the Visitorial Board who happen to be Roman Catholic Bishops, and that their determination of it must be accepted as final and authoritative. I think that, given a statute such as I have mentioned, that is, that deprivation may ensue for teaching doctrines contrary to those of the Roman Catholic Church, pure logic irresistibly leads to the conclusion that there must be persons who *ex-officio* are deemed to know the doctrines of the Church, and that the decision of questions of doctrine must be determined by them alone.

There, therefore, must be one or other of two alternatives—that all the Visitors should be members of the Roman Catholic episcopal body—a matter that no one would propose, and that certainly would be rejected by the Roman Catholic body themselves—it must be either that, or, if the charge involves a matter of Catholic doctrine, it must be split up, and so much of it as is concerned with doctrine must be determined by the episcopal Visitors. I admit that this result may be distasteful and objectionable to some, but if the objections be closely considered it will be found that the real objection lies, not in the tribunal to decide the charge, but in the fact that teaching contrary to Roman Catholic doctrine may affect the status of the Professor. If it is to affect his status, what better tribunal can you have than one composed of persons who know that doctrine, *ex-officio*?

* 16 Rich. 2, cap. 5

Therefore, I think that, logically, we are driven back to there being a statute framed, with such modifications as I have suggested, on the lines of the Queen's College statutes, providing that if a Professor contumaciously and persistently continues to teach doctrines at variance with those of the Roman Catholic Church, he will not be permitted to continue. If it be granted that the tenure of office is to depend upon his not having contumaciously continued to teach what is contrary to Catholic doctrine, surely it is essential, in the highest interests of honour, truth, and justice, that the charge should be rightly decided, that the determination of doctrine should be a true determination, and consequently that it should be made by persons competent to decide, rather than by those who admit and profess, probably boast of, their ignorance of the matter involved.

Let me take a concrete case. Suppose that liability to a debt sued for in Ireland—and as to this I am sorry your respected Chairman, Lord Robertson, is not present—depended upon a question of Scotch law, of which the judges in Ireland are ignorant, and known and recognised by their office to be ignorant, and which, therefore, when it becomes material, must be proved before them, as a matter of fact, by advocates of the Scotch Bar, and, if the case be tried by a jury, be determined as a fact by the jury. Suppose that there was a law in Ireland that in such a case the facts might be ascertained by the judges in Ireland, and embodied in a written statement, which should be transmitted to Scotland with a request that the judges of the High Court in Scotland should hear the matter argued, decide the question, and return the statement with their decision to Ireland, and that that decision, when so returned, should authoritatively bind the Irish court. Suppose, further, that it was not obligatory upon the parties to so apply for such a statement to be transmitted to Scotland, and that the Irish Court had not jurisdiction to ask for a statement upon its own mere motion, that it only could be obtained by an application by either party, and that in the supposed case no such application had been made, and that the case was tried in Ireland upon the conflicting evidence of Scotch advocates.

May I ask which would be the most satisfactory to the Irish judges upon which to base their decision in respect of this matter—the authoritative and deliberate judgment of their respected brethren in Scotland, or the rough-and-tumble decision which, on a critical question of law, should necessarily be arrived at by a jury upon the examination and cross-examination of professional men—I care not how eminent, because we all know that each of them comes with a preconceived opinion in favour of the view of the person who calls him, and that if he had not expressed that view he would not have been called as a witness. For myself I should say unhesitatingly that there was less chance of error by the former mode being adopted.

Now, I have to say that a case has actually occurred which is identical with that which I have stated—I mean Lord Yelverton's case, Thelwall *v.* Yelverton—which differs from the case suposed only in this: that there was a procedure by which the decision could be obtained, and was obtained, in another and independent action in the Scotch Courts. I myself remember that case. It turned, *inter alia*, upon the validity of an alleged marriage in Scotland. A jury in Ireland, the proper tribunal to decide the fact there, found in favour of the marriage. A proceeding was afterwards taken in Scotland, in which the Scotch Court held that the marriage was invalid. The case was brought from the Scotch tribunal to the House of Lords, and, according to my memory, the Scotch decision was affirmed by that House.

Does not the reasoning that shows that the procedure under which the validity of the marriage was determined by the Scotch Court, which knew the Scotch law, was more satisfactory than that which drove it to be decided by an Irish jury? Does not that reasoning apply with equal force to the matter at present under discussion?

Returning now to the course of determination of a charge against a Professor, I would provide that the decision of the episcopal body should be unanimous—that a difference of opinion should entitle the Professor to an acquittal, and that the body of Visitors might, if they thought fit, require that the decision on the matter should be that of *all* the episcopal Visitors. In other words, if there were three Bishops Visitors, and if the charge was being heard by two ecclesiastical Visitors and four lay Visitors, I would provide that the lay Visitors should have the power to say, "We would prefer, upon this point, to have the benefit of the unanimous decision of the three episcopal Visitors." Of course, the Professor should be entitled to be heard, and, if he so desired it, either by himself or by a witness expert in Roman Catholic theology and Roman Catholic canon law, or by both himself and the expert. I would require the question to be solemnly decided and certified under the hands of the Bishops to the entire body of Visitors, and I would require it to state the exact point in which the teaching was opposed to Roman Catholic doctrine. Anything that can be suggested for the purpose of giving greater solemnity to the decision should be insisted upon; but when arrived at, when certified, and when recorded in the records of the Visitors, I should provide that then it should be final.

So far I have dealt with this question in two aspects: first, in its logical one, and secondly, in relation to its greater probability of terminating in a just decision. I now proceed to the question of precedents. There is much tendency in our law to distribute duties amongst the members of one single tribunal composed of various elements, especially where a class of members of that tribunal either has, or is, presumed to have, knowledge of particular subject matters. The separate functions of two separate parts of one tribunal is exemplified in our oldest tribunals. In fact, they are so old, and we are so much accustomed to speak popularly of them, that the mind does not often travel back, so as to split up the tribunal into its component parts, and thus see how completely the fabric of the constitution is based upon the priciple that I have ventured to suggest.

I take as a typical case—I am very unwilling to refer to many examples, and I shall not refer even to as many as I have mentioned in my paper—I take the familiar everyday example of the trial of a case before a judge and jury. In ancient times, when witnesses were not examined, the jury of the vicinage determined the fact of the *corpus delicti* of their own knowledge or presumed knowledge without hearing evidence. Why? They were presumed to know the fact as being persons in the neighbourhood, and the accused was judged by the knowledge of the neighbourhood, by men who were presumed to possess that knowledge, without proof by witnesses on oath. The judge then, as now, determined the law, because then, as now, he was presumed by his office to know the law. But the tribunal was the one single tribunal of judge and jury, and the judgment was the judgment of one single tribunal. The court gives judgment in accordance with the verdict that has been pronounced by the jury. I commend that instance, without pressing it further, to the consideration of the Commission, because I think it will be found to be grounded exactly upon the principle that I have ventured to submit.

Another ancient practice illustrates this, too. I mean that of lay peers not taking part in the judgments of the House of Lords upon appeal. Technically, I believe, they still have the power to do so; certainly they had until the Judicature Act; and the Commission are no doubt aware that that power was about to be exercised in O'Connell's case, as reported in 11th Clark and Finnelly, but happily was not insisted upon. I would consider the fact of a Professor being retained in office by a vote of lay Visitors on a question of doctrine which differed from the decision of the Episcopal Visitors, as great an injustice, and as great a scandal, as would have been the affirmance of the conviction in O'Connell's case by a majority of lay peers against the view of the majority of peers learned in the law.

As to analogies, I refer to one, but I could mention many. Take the privilege of the city of London, that if a custom be disputed, its Corporation shall ascertain its existence and nature, shall certify it to the court in which the question as to it has arisen, and that the decision of the Corporation as to it shall be conclusive. Why? Because the Corporation of London is supposed to know its own customs, and it is considered to be more satisfactory to the cause of justice that the court trying the case shall ascertain the fact from the persons best capable of knowing it, and most likely to give an honest and unbiassed opinion than to let it be tried as a matter of fact on the evidence of witnesses, who may be accurate or inaccurate, truthful or untruthful.

And now as to precedents in Ireland—there is one which approaches very closely to the matter here. I do not think it has been already brought before the Commission. It is under the Charitable Donations and Bequests (Ireland) Act, 7th and 8th Vic., cap 97, Section 6. That Board of Commissioners was established for the purpose of administering certain chari-

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ties in Ireland and controlling and watching the proceedings with reference to certain other charities. That section—Section 6—enacts:—

> "That the consideration of all charitable donations and bequests, and of matters relating to them, in which any question shall arise before the said Commissioners concerning the usages or discipline of the United Church of England and Ireland, or of any body of Protestant Nonconformists, shall be referred to a committee of the said Commissioners, consisting of those Commissioners who are Protestants; and that the consideration of all charitable donations and bequests, and of matters relating to them, in which any question shall arise before the said Commissioners concerning the usages or discipline of the Church of Rome, shall be referred to a Committee of the said Commissioners consisting of those Commissioners who profess the Roman Catholic religion; and that whenever by reason of reference to or intendment of any usage of any such Church or body, or any district or division in use according to the discipline of any such Church or body, the object of the donation, devise, or bequest shall not be defined with legal certainty in the deed or will creating the trust, the Committee to which the same shall be referred, shall certify to the Commissioners who is, according to the uses and intendment of such Church or body, the person for the time being intended to take the benefit of such donation, devise, or bequest, or other particular facts concerning the usages or discipline of such Church or body necessary to be known for the due administration of the trust according to the true intent and meaning of the donor, and the Commissioners shall receive every such certificate, as evidence of the facts certified."

Now, if you stopped there, the word "evidence" would not necessarily mean conclusive evidence, and therefore it would not be a precedent in my favour. But then the section goes on:—

> "And shall" (that is, the Commissioners shall) "give effect to such donation, devise, or bequest accordingly" (that is, according to the decision of the Committee), "so far as the same may lawfully be executed according to the provisions of this Act: provided always that nothing herein contained shall be construed to limit or affect the jurisdiction of any court of law or equity."

The proviso at the end, of course, means that if there is litigation in a court of justice in reference to a charity which has been the subject of a decision of the Board of Charitable Donations and Bequests, that decision shall not bind or affect the court; but for the purposes of the administration of the charity by the one entire body of Commissioners, the decision of part of that body concerning it is to bind the Commissioners. Again, the consolidated statutes—I do not think it is really worth while to refer to this at length, but I shall merely mention it—relating to the Church of Ireland, passed in the session of the General Synod, in 1899, Chapter 8, deal, *inter alia*, with ecclesiastical tribunals. By section 22 the Court of the General Synod, whenever summoned, shall be constituted of three ecclesiastical and four lay judges. Then, Sections 23 to 27 inclusive prescribe the mode of ascertaining who shall be the ecclesiastical and lay judges in any particular case. Section 28 provides that every charge involving any question of doctrine or ritual shall be cognisable by the Court of the General Synod, and Section 30 provides that the decision of the majority of the members of the Court of the General Synod shall be the decision of the Court; but that in every case which involves the deposition from Holy Orders of any clergyman, the concurrence of two at least of the ecclesiastical judges shall be requisite for a decision adverse to the clergyman charged. This, however, is not a perfect analogy, because it was enacted for the benefit of the accused, but I rely upon it as a precedent for breaking up the tribunal, and giving the members of the tribunal having peculiar knowledge greater weight in the decision than other members of the tribunal are entitled to.

Although it has been necessary for me to refer to this question, my own belief is that cases of this nature will very rarely, if at all occur. I can well understand differences of opinion amongst Roman Catholic ecclesiastics existing in reference to matters taught in a Divinity School—and possibly there may be differences of opinion between the Professor of Moral Philosophy and a Roman Catholic ecclesiastic in reference to many questions of Moral Philosophy—but the Divinity School of the intended College is, I understand, to be supported entirely out of funds not derived from the State; and as regards Moral Philosophy there are two separate and distinct systems, if not more than two. There is the Scholastic Philosophy, and there are many systems of Modern Philosophy that are founded upon almost inconsistent principles. Well, if a Professor will take upon himself to teach the Scholastic Philosophy—the philosophy of St. Thomas Aquinas—he must profess that as St. Thomas taught it, and as it is recognised by the doctrines of the Roman Catholic Church, and excluding those two matters—Theology, in reference to which there is to be no public endowment—and Moral Philosophy, the necessity of teaching which separately from the Modern Philosophy, is one of the very reasons why there should be some provision for Roman Catholic Education,—excluding those two matters, it is extremely unlikely that any question will ever arise. But as I have already said, I do not act upon that. I think it is right, as it is possible that it might arise, that it should be considered and boldly faced, and I have endeavoured to do so, and to give the Commission my view in reference to it. I may say that the two matters that I have now dealt with at such great length—the first, the position that there should be a tinge of religion in the University, and my effort to in some manner define the rather inaccurate expression of a "Roman Catholic atmosphere"; and second, the mode of the determination of questions of doctrine—involve what I consider to be the two main difficulties and the two main questions to be considered by this Commission. In respect to all the other matters I shall be very brief. But there are some matters as to which I have formed an opinion which I shall convey to the Commissioners. As to the governing body of the University, I suggest that there should be a Chancellor appointed by the Crown for life.

At this stage the Commissioners adjourned, and on resuming,

The *Lord Chief Baron* continued—When we adjourned, I was referring shortly to the governing body of the University. Upon that, and upon all the succeeding matters, I shall be very short, as I confess that the questions I have already dealt with seem to me to include the main difficulties to be considered. As to the governing body, I suggest that it should consist of a Chancellor, to be appointed by the Crown for life; a Vice-Chancellor, to be selected by the governing body out of their own number; and a defined number of ordinary members, in the first instance to be selected by the Crown, and after a defined period to be elected as follows: one-fifth to be Bishops, to be elected for life by the Crown, and the remainder to be University graduates, to be elected for terms of years, some by the University, and others by certain bodies in the affiliated Colleges, such as the Professors of the faculties and Convocation. The affiliated Colleges should be, first, the new College, secondly, the College of Maynooth, and then there are questions about Queen's College, Cork, and Queen's College, Galway. What is to be done as regards these Colleges depends, in part, upon matters that I have not before me, and I should, therefore, prefer not to give an opinion in reference to them. It is one matter to consider whether, if it were *res nova*, if there were no College in Cork or Galway, Colleges should be established in those cities. I think, however, that it is another question whether, the Colleges being there—they should be disestablished. A great deal, in my mind, will depend upon the question of endowment. Anything which would divert any portion of the funds necessary for the new University College in Dublin so as to cripple its resources would practically ensure failure of the scheme. But, further than to make that observation, I prefer to say nothing in reference to either Cork or Galway. I suggest that, after a time, graduates only of the University should be eligible for appointment upon the governing body; but the interim period should

be sufficiently long to enable graduates to be sufficiently well represented, especially amongst the Catholic episcopal body; because I hope that a large number of ecclesiastical students in Ireland will take their degrees in this University. In that way they will have a large representation, from amongst whom, no doubt, many Bishops will ultimately be appointed.

But before that time arrives, say, at the end of ten years or so, there may be bodies in the new College fit to return their representatives. After that period of ten years, probably the faculties of the University will be well represented, and the affiliated Colleges may be fit to be represented, and there may be a certain number of graduates of the University constituting Convocation, who also may send forward their representatives.

In reference generally to the constitution of the governing body I should wish to say that I think the less interference by the Crown in the appointments the better. My idea of a University, as I have said before, is that it should be a self-contained body; and I should wish that, as far as possible, the members of the governing body should be returned by representative bodies within the University; but, of course, as the Roman Catholic Bishops must be part of the governing body, the question may arise whether any mode can be suggested other than that of their being appointed by the Crown.

The next material matter appears to me to be the endowments of the University and of the College. For brevity sake I shall take these two questions together. In the first place the endowment must be ample to provide for and maintain a modern University and College, with suitable and commodious buildings sufficient for the requirements of the anticipated number of students, and equipped with appliances of the most modern character. I anticipate that the number of students will be greater, and consequently that the buildings must be more extensive, than those of Trinity College, and the Belfast Queen's College taken together. I shall mention my reason for saying this. The Roman Catholic population may be taken to be slightly above three times that of the Protestant Episcopalians and Presbyterians combined, and though the percentage of the Roman Catholic population fit for University Education may be at present less than that of the Protestants, the lesser percentage is to be attributed, not to any distaste for learning, for our history and our traditions disprove that, but to the exceptional circumstances connected with the University Education of Roman Catholics; to their starvation for centuries in the matter of higher education. That, I should hope, would gradually right itself, when the new University or College is established. Then, again, even if we are to deal with the present percentage, it is undoubtedly not sufficient to counterbalance the vast proportion of three to one which exists between the two religions. The Irish Celt is, by temperament, fond of learning, and ambitious to win distinctions. The Christian Brothers, I understand, afford facilities for students drawn from the humblest classes, if they show signs of genius or remarkable talent, to obtain Secondary Education free of cost, until the student is competent to compete for the Exhibitions of the Board of Intermediate Education. Such students will, after the foundation of the new University, undoubtedly find entrance there.

To these must be added many of the students of the Senior and Middle Grades of that Board, who at present enter the Royal University. Then, I should hope that there will be a number of ecclesiastical students, of which those from Maynooth will be but a portion; and the sons of the Catholic gentry and of the middle class Catholic population will, together, form a large number. Again, the future teachers of Catholic Intermediate Schools must necessarily take their degrees in the University, as well, in consequence of the formation of the register, which doubtless will be directed by Statute, as from the absolute necessity that there will be of all these Intermediate Schools so training their students as to bring them to the door of the University. This cannot be done unless the teachers themselves have a University Education. As to this, I should wish to say one word as to my idea of education generally, which is the idea that, I think, prevailed in ancient times in England. It is that the accident of birth should not prevent a genius or a person of really exceptional talent from serving the State in any mode in which his talents enabled him to do. Therefore the arrangements of the State in relation to educating a person of that class, whom you do not meet with every day, and who, according to my experience, is to be found in all classes of life, including the humblest, should be such as to advance him from grade to grade, in education, until he was sufficiently educated to render his genius or exceptional talents available. But as the means of the families of those students are, when they belong to the humbler classes, insufficient to bear the expense of this education, or even to support the students during its later—and especially during its University—stages, the State (through the University) must make provision for bearing that expense. This is the origin of Sizarships, and many of the small Bursarships which are to be found in almost all Universities and University Colleges. The present system of National Education in Ireland might, and that of Intermediate Education actually does, lend itself to making this provision, but a provision which, as the system is not carried out during the University courses, leads, as I have already endeavoured to show, to disastrous, instead of beneficial results.

If, however, there were (as, if a new University or College be founded, there undoubtedly will be) arrangements for extending this system to and throughout the University courses, the results would be different, and wholly beneficial; as, in that case, the education of the student would not cease until he had been thoroughly fitted for his future course of life, whether that might lead to a profession or a career in Art, Literature, or Science.

At present, the child of the humblest class, by entering the National Schools, receives a certain amount of training. I hope that we shall be able, gradually, to introduce rules into that system by which from time to time the capacity of pupils will be tested, and that those that are found to be exceptionally brilliant will be given an opportunity, by Scholarships or otherwise, of gradually being brought on to Secondary Education; and I clearly see my way to making arrangements, if, indeed, they have not been already made, under the Intermediate Education Act, by which we shall be able to take such a young student by the hand, giving him, not what we at present do, a sum of money under the name of an Exhibition, but an Exhibition or a Scholarship of the class which existed in Trinity College when I was there; that is, one which entitled him to free rooms and commons during College terms, and a small sum of money to enable him to buy books, and to live while he is obtaining the benefit of Secondary Education. That can be done by a rule lately passed by the Intermediate Board, which enables us to prescribe that an Exhibition shall be tenable only at a school. Then, we should have this young person of exceptional genius or talent, brought, in his seventeenth or eighteenth year, to the end of his Secondary Education, having received the benefit of the best possible education of that class—as, no doubt, he will, by reason of his Secondary School, looking forward to the prestige of his success; I should then make provision that such a student might enter the University under circumstances similar to those which (as to persons of the religion which enabled them to compete) existed when I entered Trinity College, in which one of even moderate ability, but with a determination to succeed, and great industry, was reasonably certain of obtaining a Scholarship, which would enable him to support himself for five years in the University. If this idea were utlimately given effect to, the child of the day labourer would be able, in time, to compete among those who ultimately seek to obtain the offices of Lord Chancellor and other high positions in the State. That is my ideal of education; and it is with that idea that I make the proposals that I have laid before the Commission; but such a scheme would render it necessary, in determining the number of Scholarships, to take into account the average poverty of the students. There must also be provision made for the education of women, and for their maintenance in a separate residential hall.

I have said that I think provision must be made for a greater number of students in the new College and University than there are at present in Trinity College. I think it would be necessary to provide a sum of money sufficient to acquire a site, of the same extent, as conveniently situated, and of the same commercial value, as those of Trinity College, and of the Queen's College, Belfast, taken together, and to defray the expenses of the erection thereon of buildings as commodious, and of the same dignity, as are those of Trinity College, and of the Belfast Queen's College, and to provide a

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library, fittings, instruments, and appliances of the most modern description, sufficient to fully equip the new institution as a first-rate University or College.

There should further, in my opinion, be provided an annual sum charged on the Consolidated Fund, which should be amply sufficient to support the University and College as places of education, religion, learning, and research, having regard to the probable number of its students, and the probable poverty of the majority of them. They cannot, in my opinion, be supported upon a sum less than the sum of the annual incomes, exclusive of students' fees, of Trinity College and Belfast College, taken together. I do not prescribe the amounts of the incomes of Trinity College and Belfast College as the actual grant, as I do not know their amount. But I do know that it would be most unwise to cramp the new institution at its birth, by insufficient pecuniary means, and I understand that the income of Trinity College, which appears, from a Parliamentary return of 1889, to have been, in 1888, £38,000, is not sufficient to enable it to provide the newest appliances for the teaching of Modern Science. I do not know personally, but I have heard it said, that some of the leading members of that University think that as large a sum as £100,000 would be required to enable them to provide the necessary equipment for the teaching of Modern Science.

6481. DR. STARKIE.—£250,000, I think it was?—That strengthens my argument. Then, as to the income of Belfast College, it has admittedly been insufficient, and the sum required for new appliances is now being provided, not by the Government, but by the munificence of its citizens.

I have made much reference, throughout the latter part of this statement to the incomes of Trinity College and the Queen's College in Belfast, and I wish to make my meaning clear. Taking the matter in the abstract, and putting out of consideration existing Universities and Colleges, and existing statements and pledges of persons representing the Roman Catholics, I should like to measure the endowment of the new institution by the sum absolutely and intrinsically sufficient to properly endow and equip the University and College in the manner I have mentioned. Personally, I do not believe that the united incomes of Trinity College and the Queen's College of Belfast, joined to the present value of the existing property of those institutions, will be sufficient to properly endow the new University and College, and, therefore, were I left to myself, I would suggest very much larger sums, which would be measured altogether irrespectively of the value of the property of Trinity College and Belfast Queen's College. But I cannot conceal from myself that in this matter there is a political question involved; neither can I conceal from myself that many of the persons who have taken foremost part in the demand for this new University and College have said that the amount they demand as a provision for the higher education of the Roman Catholics is a sum equal to that which is provided for the education of Episcopalian Protestants and Presbyterians. Personally, I do not approve of that. Having regard to the numbers of the Roman Catholic population, and to the future, for which my hope is, perhaps, too sanguine, I think that a sum so measured will not be sufficient; but as there have been statements upon the part of the Roman Catholics, that they would be satisfied with an amount measured by the sum of the endowments of these two institutions, I think that, were we now to demand a greater sum, we might be exposed to the imputation of making, when the hope of realisation is coming nearer, a greater demand than had been previously made. I should not like to be a party to anything of that description, and therefore my view is that if it be necessary, as I think it will be, to provide a larger sum for this new University and College than the sum of the two amounts I have mentioned, it should be accompanied by an equivalent grant to Trinity College, and the Queen's College in Belfast, if the latter is to continue to exist, or to the Queen's University, in the North of Ireland.

My desire for the improvement of higher education, a matter that I have longed for all my life, does not depend upon any question of denomination or sect: I desire the same thing for all the subjects of the King. My view is for Ireland: I am anxious that all Irishmen shall be able to compete on equal terms with the other citizens of the empire, and to take their share in the government of the empire. If to accomplish this object it shall become necessary to endow the new University with a larger sum of money than will be represented by the sums I have mentioned, I think it would be only justice that a proportionate sum should be provided for Trinity College and for the Queen's College in Belfast.

I do not think it necessary to suggest out of what particular fund at the disposal of the State the necessary endowment for the new College and University should come. If Parliament deems it for the public weal that these institutions shall be founded, it has the power, and, to my mind, is under the obligation, to provide sufficient endowment for them. But it is right to point out that in addition to part of the sum provided for the Royal University, which will be set free, and which I estimate at about £10,000 a year (subject to possible compensation for disturbance of vested interests), there are three sums of money to which Ireland appears to have a special equity. In this matter I am speaking not as a Roman Catholic, but as an Irishman.

I hold that, upon the true policy of the Church Act, Ireland has an equity against the Imperial taxpayer, to an amount amply, and more than amply, sufficient to provide for the new University and College, to give a liberal addition to the endowment of Trinity College, and to provide either for the foundation of a Northern University or to additionally endow the present Queen's College in Belfast. I refer to three sums of money—three annuities—from which the Imperial Fund, that is the Consolidated Fund of Great Britain and Ireland, was relieved by the operation of the Church Act of 1869, by sums of money being taken from a fund which is admitted on the face of that Act to be a peculiarly Irish fund—I mean the Church Fund. At the time of the passing of that Act there were payable by the Imperial taxpayer three separate annual sums of money. There was, first, the £26,000 a year for Maynooth; there was, secondly, the amount for the Queen's University, which was £4,962, and, thirdly, there were very large annual sums under a grant known by the name of the *Regium Donum*. I cannot give the Commission the exact amount of those annual sums payable as *Regium Donum*, but Mr. Gladstone stated that they amounted to between £45,000 and £50,000 a year.* Now, Parliament, by the Act of 1869, created a fund which has always since been treated by Parliament as an exclusively Irish one, the residue which should remain of the Church Fund after making provision for vested interests. How was the money to arise from the disposal of the Church property dealt with by the Act? That Act provided, to a large extent, for the Imperial taxpayer at the expense of this Irish fund.

By it the Consolidated Fund was relieved from the £26,000 a year, which was previously payable out of the Consolidated Fund for the benefit of Maynooth, but the price that was given for relieving the Fund of that £26,000 a year, was taken, not from the Imperial taxpayer, but from the specially Irish Fund, the Church Fund. Identically the same thing was done with the annuities of the *Regium Donum*. An almost similar operation was effected in respect of the £4,962, the annual provision for the Queen's University by the Acts which established the Royal University (42 & 43 Vic., ch. 65; 44 & 45 Vic., ch. 52.)

Thus Ireland appears to have a special equity against the general taxpayer of the United Kingdom in respect of those three annual sums of £26,000, £45,000 (or whatever may have been the amount of the *Regium Donum*), and £4,962; and if the amount of those three sums is taken with the most moderate interest for the periods which have elapsed since those Acts came into operation, we shall not only have enough to provide a capital sum of money more than sufficient for all the purposes I have suggested, but also annual sums more than sufficient for all purposes.

As to the teaching in the new College, there should be added to the Faculty of Theology (for the teaching of which no part of the funds of the University is to be applied), eight faculties, namely, Arts (including a Chair of Pedagogy), Law, Medicine, Music, Engineering, Architecture, &c., Science, and, lastly, one to which I attach great importance—Economics and Political Science, including Commerce and Industry. These are the faculties in the reformed London University, and it is from the Report of that institution that I have taken the statement of these faculties.

With reference to the consideration whether any existing College should be affiliated to the new University, I entertain a strong opinion that it would

* Hansard, cxciv., 443.

tend much to the interests of the State and of society in general, if the College of Maynooth were affiliated to it. This subject I have already developed. I am also rather in favour of the students being resident in the College, but if non-resident, I think it extremely expedient that they should attend lectures; although, having regard to the practice of Trinity College and the Royal University, I do not see my way to refusing a degree to a student who does not attend lectures. A degree obtained by private study should, I think, be differentiated in some way from that obtained by a student resident in, or attending the lectures of, the College, as a degree attained simply by examination is not, in my opinion, a degree. A person may obtain it who has not that University culture which is indicated by a University degree. At the same time, I think that if that principle is to be applied in the new University it should be so applied gradually and tentatively; but had I my way I should have the courage of my convictions and apply it, although gradually and tentatively.

Then, as to the fifth head of my evidence—

"SHOULD THERE ALSO BE AN ADDITIONAL UNIVERSITY ESTABLISHED IN BELFAST, AND, IF NOT, SHOULD THE ROYAL UNIVERSITY BE CONTINUED?"

I do not see how an additional University can be established in Belfast, having regard to the attitude lately assumed by the Presbyterians. It is therefore necessary that the Royal University should continue, and I should reconstruct it in such a manner that the authorities of the Belfast Queen's College should form the major portion of the Senate. I entirely agree with the views of the authorities of the Belfast College that having such a Senate as that of the Royal University to control those interested in the Belfast College, does not work to the advantage of the College, and is not in theory defensible. I am confident, however, that this connection between the Royal University and the Belfast Queen's College will not continue long after a new University and College shall have been established. The Presbyterians will, I think, very soon after that establishment, propose that they, too, should have a University. I wish here to remark, in concurrence with some of the previous witnesses, that, in my opinion, a University in Belfast would be a most useful institution, that it would not interfere with either Trinity College or the new University in Dublin, but would develop upon entirely new lines. I have some acquaintance with the North of Ireland, in consequence of frequently going as Judge of Assize on the North-eastern Circuit, during which we are often from two to three weeks in the city of Belfast. I think that you might have in Belfast a type of University new to Ireland, but of an admirable description.

May I exemplify it by referring to one establishment, with the working of which I am familiar? I refer to what I may now call the world-wide known firm of Harland & Wolff, shipbuilders. The building of a ship involves, as the Commissioners are of course aware, the most intricate calculations, depending upon the highest mathematical and physical knowledge. In that firm are kept two gentlemen, having the highest grade of mathematical knowledge, solely for the purpose of working out the lines of the frames of the ships upon certain given conditions, such, for instance, as tonnage, the amount of capacity for cargo required, the number of passengers to be carried, the character of the trade upon which the vessel is to run. These gentlemen have, from those conditions, to determine mathematically the frame of the ship. It depends entirely upon abstruse mathematical calculations, and the success of the firm depends upon those calculations being properly worked out, so that a true result shall be arrived at. To speak generally, a ship in which the thing aimed at is a maximum rate of speed, independently of all other considerations, will be worked upon one set of lines. A ship which is to have a moderate rate of speed, such, for instance, as those of the White Star line, with a certain carrying capacity for carrying cargo, which will make the freight thereby earned a material element in determining the probable profit to be derived in working the ship—would be framed upon an entirely different set of calculations. This instance clearly shows the value in Belfast of the highest mathematical knowledge, and so long as such positions are known to be open to clever young men with attainments of the kind I have mentioned, it is certain that many people will apply themselves to such studies as will result in the attainment of that knowledge.

It is well known that formerly teachers of Pure and Applied Mathematics in Protestant schools were superior to those in Catholic schools. Why was this? Because a high knowledge of Mathematics and Physics probably assured the person who had them a Fellowship in Trinity College. But for one such Fellowship actually vacant there would be five or six candidates, and, therefore, those of the candidates who were unable to obtain a Fellowship, but who still, by their study for that Fellowship, had acquired great mathematical knowledge, became available as teachers in the Intermediate Protestant Schools. The result is, as I know myself, that although the Intermediate Board has now been established for upwards of twenty-two years, we hardly yet are able in our Catholic schools to compete with the Protestant schools in respect of the higher Mathematics, although I venture to think that an Irish Celt is as capable of attaining to proficiency in Mathematics as any other resident in Ireland.

Again, I may mention a matter as to Applied Chemistry, as to which education in Ireland is simply deplorable. By that art large fortunes can be made. I know a gentleman (resident, not in Belfast, but in Cork) who is at the head of a large manufactory of the purest chemical compounds. The trade is a lucrative one, and the manufactory gives employment to a great number of persons. That gentleman was educated in Germany. There is no place in Ireland at present in which a person aiming at that position can be educated. The members of the Commission are aware that in Germany, in Switzerland, in France, in a great number of other European countries—in fact, in nearly every other European country—provision is made for industrial education of that description. As a rule, that trade is out of this country. It is a lucrative trade. Give an opportunity to young men to fit themselves for positions as managers of institutions of that description, and undoubtedly the want will be supplied.

The Belfast people, the people of the North of Ireland, are eminently a practical people, and if the endowment of the Belfast College is increased, and if it be allowed to develop on its own lines—that is, not confined by the Regulations of the Royal University; not bound to insist upon a certain knowledge of other subjects, which perhaps is not capable of being attained by a person whose mind is entirely mathematical, but who may be able to acquire a great amount of chemical and scientific knowledge—my idea is that, without saying anything as to what its ultimate success may be in classical learning, it will develop according to the lines which seem to be prevalent in Belfast—those lines which lead to remunerative employment, and that you will have a University there which will do more than anything else in the North of Ireland to repair some of our deplorable loss in higher industrial education.

Upon the sixth head of evidence,

THAT PROVISION SHOULD BE MADE FOR THE HIGHEST CLASS OF INDUSTRIAL, COMMERCIAL, AND TECHNICAL EDUCATION,

I think it of the highest importance that encouragement should be given to commercial and industrial teaching. Provision has already been made in the new Agricultural Department for the improvement of Technical Education. But the teaching of all these subjects, to be such as will enable the people of this country to compete with foreign nations, should be continued up to the University, and throughout the student's University career, and the subjects should be included in the courses for degrees. It is for that reason that I suggest that there should be a faculty similar to that lately formed in the London University.

6482. Viscount RIDLEY.—You have given us your evidence in so clear and full a manner that I, for one, do not propose to ask you any questions; but there may be some points upon which other members of the Commission may wish you to amplify your views?—I shall be happy to answer any questions that the Commissioners may desire to put to me, to the best of my ability.

6483. Most Rev. Dr. HEALY.—There is only one question I desire to ask you. You have explained very clearly the constitution of the proposed Visitorial Court. Do you mean that to be a Court of Appeal from a decision of the Governing Body of the University, or a Court of first instance?—My idea was that it should be a Court of first instance, and a final Court. I think these are the most unpleasant matters that can arise, and I think that if they did

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occur, to have a decision upon them long delayed would be likely to work the highest injury to the University. I hope myself that they will never occur; but if, unfortunately, they do occur, I would wish them not only rightly, but rapidly, decided; and I would lift them from the decision of the governing body of the College to that of the governing body of the University, which I anticipate will govern a great number of other Colleges.

6484. Mr. Justice MADDEN.—There are one or two matters only that I wish to bring under your attention, in order that I may fully appreciate your views. I observe that throughout your evidence you kept two matters distinct: first, the educational requirements of Ireland, as demanding the establishment of a well-endowed College, acceptable to Roman Catholics; and secondly, the claim for equality and finality, which you think would be best secured by placing the College in the position of a University?—Yes; I treated them separately.

6485. Taking the College first, I think your general view is that it is absolutely essential to the success of the College that the responsibility of organising and working it should be left to the Roman Catholics, by whom it is demanded; and that it should be so constituted as to be capable of being used by students in Maynooth—I understand that you regard these two features as essential?—I do.

6486. And that no College would be satisfactory unless those two elements were combined?—Quite so.

6487. Now, passing to another question closely allied to the former—the power of the College to grant its own degrees—I understand your objection to affiliation with the Royal University is based upon an objection not to the principle of the affiliation of several Colleges in a common University, but to the particular character of the University with which it was proposed that the Roman Catholic College should be affiliated, namely, the Royal University?—Yes; my objection is not to the abstract question of affiliation with a University. That is proved by what I have said, that I would be perfectly satisfied with, and would like, an affiliation with the University of Dublin.

6488. So I understood; your objection is not to affiliation *per se*, but to affiliation with the Royal University—you would not object to affiliation with a University of a different character?—Certainly not.

6489. The objection which you have raised to the project of affiliation with the Royal University is based on the character of that University as it at present exists, and it is, as I understand, twofold: First, because that University is founded on the principle of secular education, apart from religion, and secondly, because it is founded on the principle of mere examination without teaching?—Yes.

6490. You object to affiliation with it, so long as it continues to be based upon these two principles?—I do. I boldly say that I regard the word "University," as applied to an institution of such a character, as a misnomer. No person will ever induce me to say—though I am a member of the Senate of that institution—that it should be regarded as a University at all.

6491. Do not understand me as differing from you. I only want to elicit your views. You object to affiliation, not *qua* affiliation, but affiliation to a University possessing these characteristics?—Yes.

6492. You have said, and I am far from disputing the proposition, that there would be difficulties in effecting such a change in the Royal University as to render it acceptable. I suppose you recognise that there would be difficulties in the way of any reform that can be suggested?—Certainly.

6493. I observe that in the portion of your evidence in which you dealt with the construction of the governing body, you brought it forward with a full appreciation of the difficulties?—Undoubtedly. I have studied the question since 1855; and for many years I had given up any hope of ever myself seeing the question solved. Fortunately those hopes have been revived by the appointment of this Commission.

6494. In fact, the solution which you suggest has been arrived at in view of the enormous difficulties of the question, and is not your ideal one?—No; my ideal is affiliation with the Dublin University.

6495. Therefore I suppose you would advise us to approach the question from a practical point of view?—Decidedly.

6496. And having regard to difficulties of various kinds, to some of which you have yourself called attention, and others to which I need not advert, to arrive at the best practical solution?—Certainly. I may be allowed to say that I think my function is not identically the same as that of the members of the Commission. You have been good enough to summon me here in order to ask me what is my opinion on the various questions involved in what is called the Irish University question. I have given them to the best of my ability; but it is not for me, I take it, to enter upon the additional question, whether it is impossible to carry out what I term my ideal scheme. Of course there are elements which necessarily must enter into the consideration of the Commission, but which have not entered, and I do not think ought to enter, into my consideration.

6497. You have brought that out very clearly in the evidence you have given. I think you will agree with me that there is a great want of suitable provision for the education of the mass of the Irish population, without any distinction as regards religion, more especially with regard to technical instruction, and the teaching of Applied Science?—I agree with you entirely in that.

6498. That part of the question referred to us is separable from the Catholic claim?—Entirely. The reference to this Commission, as of course you are aware, is not confined to the question of higher education for Roman Catholics.

6499. Quite so; and you have called attention to the requirement of additional provision for the teaching of technical subjects and Applied Science, especially in the North of Ireland, where the population, in some parts, is not Roman Catholic?—Well, for the purpose I speak of, it may be treated as mainly Presbyterian and Protestant Episcopalian.

6500. No man, if you will allow me to say so, has taken a more active part in introducing technical teaching, both in Primary and Secondary Education, than you have done, and I am sure you recognise the importance of that branch of University Education?—Certainly; I consider it a most important branch of University Education. I have done as much as in me lay to assist others, who were much more able than I was, in devising a scheme by which those results might be arrived at. They are hardly as yet in practical operation. The Treasury is necessarily slow in matters of this description; but I hope they are in train. You are yourself aware of how, in the Intermediate Board, we have endeavoured to get a system of technical instruction into operation. I thoroughly agree with you that, irrespective of creed and party, and treating it as a matter between nation and nation, there is a vast need for such changes in the system of education as will give our young people such industrial and technical knowledge as will enable them to successfully compete with the foreigner. In my opinion it is one of the things that lie, I might almost say, at the root of the position of the Empire.

6501. That need being so great, do you not think that a proposal that met it reasonably, and in a practical way, might fairly be adopted, although it did not attain perfection?—Certainly. I think that in this world we live in—especially in the political world we live in—perfection can never be attained, and I do not hope for it.

6502. I think you agree with me that it is rather difficult to say under what circumstances finality in legislation can be achieved?—I thoroughly agree with that. What I wished to point out was the distinction between want of finality resulting from causeless agitation and want of finality resulting from an agitation for which there is adequate cause. I do not think agitation will ever cease in Ireland.

6503. But a reasonable approach to finality ought to be one of the objects that we should keep in view?—Certainly. I think that is a very vital matter. The unsettled state of this question of University Education—of which, as I have told you, I have had personal knowlege since 1855—has, to my mind, worked immeasurable injury.

6504. A view has been suggested to us that you evidently do not share, namely, that a system of federation or affiliation of Universities has necessarily inherent in itself an element hostile to finality. You evidently do not agree in that view, because your ideal system is one of federation?—I suppose that what you refer to is this, that in a federation of Universities or Colleges, there is a certain inherent mischief that must be carefully guarded against—that when you have a number of Colleges federated under one University, there is necessarily a competition amongst them, which must be determined by examination, and that therefore it has a

tendency to cause undue importance to be attached to the result of examination. Well, I am strongly of that opinion. I think examination is necessary, under certain circumstances, but I regard it as a necessary evil; and I would restrict it as much as I possibly could. In this age of competition, when positions of value are open to all who compete for them, there necessarily must be examination; but I rather think that every year a trained intellect applies itself to studying for an examination, the man benefits himself less than if, during the same period, he had applied himself to the study of the same subjects, uninfluenced by any pecuniary consideration, such as the reaching a particular position by it. For my own part, when I was in Trinity College, I think I always used to study my Mathematics better in the earlier part of the year, when there was no question of examination, than when it came to the months approaching the examination, in which I was asking myself, not how a particular train of thought could be best worked out, but what questions I should probably be asked in the examination. I think that what you have referred to is a real difficulty.

6505. The difficulty would probably be less if the Colleges were autonomous, and conducted their own examinations on their own lines?—Yes, to a certain extent; but I do not think that should be carried too far.

6506. There was an interesting part of your evidence in which you spoke of the position Trinity College ought to take in the educational system of Ireland. I do not propose to follow you in that, not because I ignore the importance of the subject, but because it is outside the sphere of our inquiry?—So I understand the Commission have ruled.

6507. I should like to ask you a question with regard to the Test Act. You have spoken eloquently of the duties of Universities with regard to religious instruction; and you mentioned that Trinity College, though not bound to do so by Act of Parliament, has maintained religious services, and a course of religious instruction, for Protestant students. I suppose you are aware that the governing body of Trinity College has expressed its readiness to make adequate provision in that respect for students of other denominations?—I understand it has.

6508. That is important to notice, in reference to the principle which you have so well laid down, that every Irishman, no matter what his creed, is entitled to the benefits of the University of Dublin. But I pass from that, because any further discussion would be outside our sphere, although I am sure that we have all listened to you with very great interest. There is one point more—a point which you and I have had before us in the working of the Intermediate Board—the necessity of a Register of Teachers of Secondary Schools. You have mentioned that the Intermediate Board found itself unable to take any action in the matter. On that point there was no difference of opinion whatever?—I understand not.

6509. I merely want that it should be understood—the particular reasons which led to that conclusion were not the same in regard to all the members of the Board?—That is quite so.

6510. You have stated very fully your exact point of view, and you are perfectly accurate, if I may say so, in stating that the united action of the Board was not arrived at by reason of their entertaining identical opinions in regard to the existing state of things?—Exactly so.

6511. Professor BUTCHER.—I should like to ask you one question about a point you laid some stress on—that is the closer association of ecclesiastical and lay students in University Education. No doubt, you are aware that different views have been expressed before this Commission upon that subject?—I am, but I entertain a strong opinion upon it myself.

6512. Yes, I quite understand, and a point which I wish to put before you is this: Supposing the view prevails that ecclesiastical students should not pursue their secular studies in association with lay students, the effect would be this, in the first instance, would it not—that the Roman Catholic clergy would, as a rule, not be University men at all?—That would be the result.

6513. And yet clerical influence must be an important factor—some would, perhaps, say the most important factor—but, at all events, an important factor in the government of a Roman Catholic University or College. We agree in that?—We do.

6514. So that you would have this result, that the government of the University or of the College would be largely under the influence of men who were not University men?—I do not go so far as that.

6515. No?—Not at all. My idea is that the Roman Catholic Bishops (I say it with great respect) would practically have very little influence in University Education, subject to this, that they would see that not only were there safeguards against teaching unsound doctrine, but that these safeguards were actually effective and acted upon. For instance, I have suggested that the Roman Catholic Bishops should be one fifth of the Governing Body. Suppose that I myself were one of the Governing Body (this is the only way in which I can test it), and that a question arose before the Board as to what should be the course in Mathematics (I say that, because it is the subject I am best acquainted with), I would not have the slightest hesitation in opposing myself deliberately, time after time, against all the five episcopal members of the governing body, if I thought they were wrong.

6516. You do not suppose that, apart from any special subject where expert knowledge is required, in the general government of the University or College, the clerical influence would be out of proportion of the mere number of clerics on the governing body?—I think not. I can only state my own opinion as to what I should do were I one of the Governing Body. There are some matters in which I should attach almost supreme importance to the opinions of the Bishops. The arrangements in reference to the morality of the students, the time at which they should be in at night, the circumstances under which permission to stay out longer than usual might be granted, the mode in which any breach of these regulations should be brought before the Dean or Governing Body, the arrangements that there should be for morning and evening prayer, the necessity of attending it, or the arrangements and excuses for not attending it, the necessity for attending religious instruction such as there is at present in Trinity College, the attendance upon catechetical lectures, the arrangement of the course of religious study, so that no student should leave the University until he was thoroughly imbued with the principles of his religion, and believed in its fundamental doctrines, not merely because his teachers told him that they were true, but because studying tradition, and the Holy Scriptures, and having regard to Divine Revelation and to the teaching of the Church through the Pope and the Bishops, he had arrived at that conclusion by the use of his own intellectual faculties in reference to all those matters, I would look upon the influence of the Bishops not only as necessary, but as absolutely supreme. But, the moment you go away from those, and when you come to the questions as to what are the courses of study, and what are to be the regulations for attending on lectures as distinct from merely preparing for examinations and matters of that description, I really, were I on the Board, would give the same attention to their views upon the subject as I would give to them if they were merely members of the Board or Governing Body, and not Bishops. I would have regard to their educational knowledge, which, with some of our Bishops, is very great indeed, and I would take into consideration, and have great respect for their views upon all those subjects, but, then, I would view them, not in their capacity as Bishops, but as individuals, and having regard to the educational knowledge of which they were possessed.

6517. To revert to my point, which was rather this—the relation between a new Catholic University or College and the College of Maynooth—I suppose from what you have said, you would agree with this—that the laity, the Roman Catholic laity in Ireland, would be immeasurably better satisfied if their priests had received a University Education like themselves, than if they simply got their secular education within the walls of Maynooth?—I am strongly convinced of that.

6518. That is what I wanted to bring out, and it was in relation to that that I spoke of the government of the College; they would feel more confidence in a governing body in which ecclesiastics had this University Education, than in one in which they had not?—Certainly, and I am in hopes that, if my scheme is successful, some Commission sitting here fifty years hence may find that there are on the Board of this University a greater number of Roman Catholic Bishops even than are sketched in my scheme—men who will be placed on the Board, not because they are appointed by the Crown as Bishops, but because they are appointed by the faculties of the University as the best educationists.

6519. Your view is exactly the same as that which I have gathered myself in talking with Roman Catholic laymen in Ireland, some of whom go so far as to say

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that if the new University was not used for the education of the priesthood, they would rather go without it?—I am in great hopes that they will avail themselves of it, but if they do not avail themselves of it, although we shall regret it, we must do the best we can, even although we have not the advantage of the ecclesiastical students joining in it.

6520. I pass to another point. You say, and it seems very proper, that the University statutes should prohibit the teaching by a Professor of anything contrary to the doctrine of the Roman Catholic Church. But would you go further in the same direction:—Assuming, as you do assume, that the University is open to students of all denominations, does it not almost follow that the Professor should be equally forbidden to teach things contrary to the doctrines of other Churches?—I think not, because there will be a differentiating quality, or a differentiating element in the character of this University as regards the Roman Catholic students and Protestant students. That I have called a tinge of religion—the same characteristic that distinguished Oxford and Cambridge in relation to Protestant students and Catholic students. Now, I will take the subject of Moral Philosophy. How is it possible that the doctrines of the Scholastic Philosophy, the Philosophy of St. Thomas—how is it possible that that can be taught without coming into conflict with other religions?

6521. I quite admit there are some branches of Philosophy which so closely overlap or intertwine with Theology that you cannot separate them, and one would be almost inclined to let them stand apart from ordinary studies as theological; but, to take the instances of Oxford and Cambridge, there is here a very distinct tinge or colour of Church of England or Anglican Theology. Yet it would be considered—I do not say illegal, for I do not know that it is illegal—but it would be considered exceedingly dishonourable in a teacher, who was teaching a purely secular subject, if he did, through that, attempt to affect the religious beliefs of his hearers. The point I want to put to you, therefore, is this, that where you abolish tests, does it not follow, —if not as a matter of law, as a matter of honour and principle—that religious doctrine ought to be altogether excluded from the teaching of secular subjects?—I would hope that any Professor in the new University would never say anything, either in his lectures, or in his professorial capacity, that would be, in the slightest degree, hurtful to the religious feelings of any of his hearers, and I should think that it would be one of the duties of a Professor to aim at that; but it is one thing to bind a body by a hard and fast rule so as to make it criminal in them to transgress it (for, practically, it is criminal if it causes a Professor to lose his professorship), and, therefore, I think I am on safer lines, in the suggestions that I make, in following strictly the law as regards Oxford and Cambridge, the application of which I know has worked well, of leaving it to the Professors, and then they would be bound by the same laws to act in the same way as I think they ought to act as gentlemen and Christians. Let me exemplify it in this way: This Conscience Clause in the Oxford and Cambridge Act of 1871, no doubt, was most anxiously considered. I rather think I see through the Act the hand of Lord Selbourne, then Sir Roundell Palmer, who, unless I mistake, was Attorney-General at the time, and, of course, with his great love for Oxford, he had a considerable part in framing this statute. Now, the Conscience Clause is not that the Professor shall not teach anything that is contrary to the tenets of any particular religion, or even of the Anglican religion, but it is that no student shall be obliged to attend any lecture when his parent, or he himself, if of a certain age, objects to it upon religious grounds. In other words, the way that it is worked is not to qualify the lecture, but to qualify the obligation of the student to attend. The Professor is left free; it is left to his honour and feeling as a gentleman, and to his love for his own class (which I should think would most of all govern him) to work upon lines that would not be injurious to their feelings; and I think the same principle ought to be applied here.

6522. Then, if you apply the analogy of the Test Act in Oxford and Cambridge, you could not insert a clause which seems very reasonable, prohibiting the teaching by a Professor of anything contrary to the doctrine of any particular Church?—But, surely, no one could doubt for one moment that if a Professor in Oxford or Cambridge taught heresy, and contumaciously persisted in it, he would be quickly brought up. I know that he would have been in Trinity College when I was a student there.

6523. I think he would be brought up, as you say, but I think he would be equally brought up if he taught religious doctrines violating the conscience of any student, whether belonging to the Church of England or not?—I do not know that we quite understand each other. I cannot present to my mind any question in Classics, in Mathematics, even in Natural and Applied Science, or in the teaching of languages—in all the general matter of a University; I cannot present to my mind anything in which it would be necessary or even possible to teach anything that would be against the doctrines of any religion. It is only when we come to the doubtful questions—the questions of Moral Philosophy and History,—there we are upon closer ground. Perhaps, I might even say that there could not be any difference of opinion in reference to Biology; that is a more doubtful matter. But, with the exception of Biology, perhaps Midwifery, History, and Modern Philosophy, I do not see any subject with reference to which the question could arise at all.

6524. But questions have arisen with regard to some of the Natural Sciences in foreign Universities, although perhaps, it is not worth while going into that matter? —That is, that they might teach what was contrary to Revealed Religion, but I thought you were now dealing with matters that would be obnoxious to one sect of Christians. Of course, I am quite aware of the teaching in some foreign Universities contrary to Revealed Religion, for instance, that the soul is not immortal, or that there is no God.

6525. But I understood that you had passed on to argue that there were no questions of religion at all that could come into the teaching of these Sciences?—Not at all, no; I meant between different denominations of Christians. Of course, there are all the great questions dependent upon Agnosticism. I am quite aware of all those.

6526. I will not waste time over this particular point. All I really wanted to bring out was that elsewhere, in other Universities where tests are abolished, the conception prevails that a Professor ought not to teach anything that would hurt the feelings of anyone of any denomination?—That is entirely my own view of the question; but whether that should be embodied in the statute or left to the Professor himself is a matter entirely for the Commission. The general tendency of my mind, of course, as I think it is in the case of most University men, is to restrict the Professor as little as I possibly can.

6527. Then we come to the charge against the Professor which may result in his dismissal. The only thing you would take into account, apart from misconduct generally, would be the question whether he taught doctrine contrary to the Roman Catholic Church? —That is my view.

6528. Here I have one suggestion to make, and I should like to know your opinion as to it. I think it is a very important and practical matter. I perfectly understand your proposal as to the constitution and functions of the tribunal, but would your purpose be equally met by a modification of this kind? Supposing the tribunal consisted entirely of laymen; but that it were enacted that, on any question where doctrine was concerned, this tribunal should be bound to take the opinion of the Episcopal Body, and to regard that opinion as authoritative, would not that give to the Church the kind of control of the particular questions which you desire?—It certainly would, and that brings us then to the constitution of the body.

6529. Yes, but the particular point I refer to is this: You are no doubt as well aware as I am of the popular feeling there is against having either an ecclesiastical tribunal or a tribunal composed partially of ecclesiastics?—I am, perfectly.

6530. And as a practical suggestion to meet what I know will be an immense difficulty in giving effect to any recommendations we might make, might the Church —I cannot ask you about the Church—but would you personally be satisfied with referring questions of doctrine to the Bishops in exactly the same way as you, in your legal analogy, refer from Ireland questions of Scotch law to Scotch judges, and accept their decision as final?—*Quoad hoc.*

6531. I mean *Quoad hoc*, on questions of doctrine?—I would.

6532. The practical advantage of that, it seems to me, would be that you would not put public opinion up against you; that it would give far greater confidence

to the outside world if you said "We have a tribunal which consists of laymen, and we only consult ecclesiastics on questions which come necessarily within their province"?—Well, upon the question of preserving the teaching free from error as far as Roman Catholics are concerned, I would be quite satisfied with that modification. But that drives us back to a different question, and that is, is it right that the Roman Catholic Bishops should not be represented upon the Visitorial Board. You see, that is a wholly separate question.

6533. Certainly, but I was not really so much considering that as thinking of the kind of tribunal which might be appointed by the Crown. It might, as I am suggesting, be a body of laymen; will not such a tribunal make the project most feasible, and raise least objection?—Well, I think I may say this. My only object in the lengthened observations that I made in reference to this tribunal was to suggest a practical mode of providing a sufficient safeguard. All that I want is that there shall be that effective safeguard, and that it shall be effectively worked. As it appears to me, I would be satisfied if the Bishops were consulted as an outside body, as distinct from being members of the tribunal.

6534. Some of the analogies which you gave really favour that scheme quite as much as the other?—Certainly—for instance, the question of the custom of the City of London.

Professor BUTCHER.—Yes, and some others also, I think.

Mr. Justice MADDEN.—Perhaps I might suggest the old practice of Chancery Judges, in sending a case to a Common Law Court for its opinion; they were supposed not to know the common law.

6535. Professor BUTCHER.—Of course, I do not know whether it would satisfy the Church or not?—You are better advised on that subject than I am, Professor, as one of the members of the Church is amongst your own body. Of course, I can speak only as a layman, and not for the Church.

6536. But suppose the Church did not think that they had a sufficient and adequate safeguard under such a scheme; they, as it has been already pointed out, have always an ultimate safeguard in their own hands—that of withdrawing the students?—Ah, Professor Butcher, I am very anxious to render that an impossibility.

6537. So am I?—It would be destruction to the University.

6538. I think it is the last thing in the world to which one should resort. All I mean is, it has been put before this Commission on episcopal authority, that in the end that is what they can do, and that is what they would do?—I have read the evidence to which you refer, and I myself thought—I may have thought wrongly—that the matter was not left in a complete and finished state. My suggestions, if acted on, will prevent such an unfortunate conclusion as that of withdrawing the students ever being arrived at.

6539. I sincerely hope that this power may never be enforced, and I cannot help thinking that a scheme, such as I suggest, which is a very slight modification of your own scheme, might perhaps go far enough to provide all the necessary safeguards?—I am satisfied that my scheme should be modified in any way that is thought right; there may be many other modes of solution, but no other mode has struck my own mind.

6540. Professor EWING.—The last question which was put to you by Professor Butcher presents itself as a difficulty to my mind also. Admitting, as it has been admitted, that the ecclesiastical authorities can, in the last resort, virtually stop the operations of any Catholic College or Catholic University by withdrawing the students, does not that give them essentially the whip-hand, whatever paper constitution is drawn up? I mean whether you have a mixed court, such as you suggest, in which the Bishops should be the only judges on ecclesiastical questions, and part judges on other questions, or whether you have a court such as Professor Butcher has suggested, where the Bishops would be excluded from the governing body, but would be appealed to as an outside body in case of ecclesiastical questions arising—whichever of those solutions were adopted, or whatever other solution were adopted, is it not the case that if the bishops have this power in their hands of withdrawing the *clientele* of the College in the event of things not going in the way that pleases them for any reason, that necessarily has the effect of making the College be governed by the ecclesiastical body?—I do not think it does, Professor Ewing. We must distinguish between two different states of facts. We must take it for granted that the Roman Catholic religion is an existing religion, and that every Roman Catholic student will abide by that which that religion teaches. Now, that religion teaches two things: First, that the student must believe, under penalty of not belonging to the Church, every matter that the Roman Catholic Church proposes to his belief. Nothing that is done here, or in any other country, or that ever can be done, can ever prevent the existence of that law. The Roman Catholic religion next teaches that the Bishop of the diocese is, subject to an appeal to Rome, the authoritative judge of what are the doctrines which the Roman Catholic Church proposes to our belief. So that under any conceivable state of facts, any Roman Catholic student in a University must obey his Bishop to this extent—that if he teaches that a particular doctrine is contrary to the Roman Catholic faith, the student, if he wishes to remain a Roman Catholic, must either go to Rome upon an appeal, or he must act upon the Bishop's decision. That is one of the conditions that are set for the discussion of this problem. It may, and it must, lead to certain results, but those results are inherent in the problem set, and the conditions that I have stated. But there is another matter. What I have stated is confined to matters of faith and morals, and our Bishops have no right to intrude beyond the province which is within their jurisdiction. They do not. If they did intrude beyond that province in a clear and defined way, there would be no obligation upon the Catholic laymen to obey them, and my own opinion is that they would not be obeyed. But we have had no example of it in this country which renders it necessary to refer to it. Then it must be assumed, when we are dealing with a body of teachers who are acting as the interpreters of the Divine Law that binds their flocks, we must assume that they will act—as we do—judges who administer the law of this country under a sanction very, very much, less, no matter how great it is—that they will act to the best of their honest opinions. No doubt they may be misled or mistaken upon a particular point of doctrine—I do not for a moment dispute that—so that there might be an erroneous decision. But what I do not think would happen is this, that a Bishop would ever venture to interfere in reference to anything that was outside the domain of faith or morals. For instance, to put a concrete case, I will take it that a strong political feeling springs up in a University—as it very often does—and the Bishops thoroughly disapprove of that political feeling—I do not for one moment believe that a Bishop, because he disapproved of that, would think for an instant of so prostituting his sacred office that by reason of that he would say anything that was not imperatively demanded from him by reason of his being a teacher of faith and morals. No doubt it would be physically possible for him to do it; a person may physically be able to do things that under no possible state of circumstances would he actually do. If a person is brought up before me as a judge for a crime which under the circumstances was almost excusable, I may have the power of sending him to penal servitude for life, and so have my colleagues; but everybody may be certain that if a case of that sort arose, unless we had absolutely lost our senses, we should not take such a course. Therefore, in the same way, I do not think that the Bishops would have this University at all in their hands. What I do think is that they would have this in their hands—that no false doctrine or heresy should be taught in the University. Further than that they would not go.

6541. You do not consider it is possible that a case might arise in which the Bishops might say: "We do not consider that the tinge of Catholicism in the University is strong enough to suit us"?—If by "tinge" is meant "atmosphere," I do not think that that would arise at all. What I understand by "tinge" is the character that is given to the University by virtue of its charter, its statutes, and its bye-laws. I derive the question of the tinge of a University from the fact that I should think it would be rendered imperative, as in Trinity College, to attend morning and evening prayer, to attend Divine service upon stated occasions, and to attend catechetical lectures upon particular occasions. I do not think it would depend, as some of the witnesses have suggested, upon the number of Roman Catholic students as compared with the number of Protestant students. I do not think the Protestant students would trouble themselves about attendance upon catechetical lectures. I may say that when I was in College, one of the great advantages for which I was envied by all my colleagues who happened to be Protestants was that I was not bound to attend "catecheticals"; I was considered to be in a position of vantage

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upon that ground, and I never troubled myself about their catechetical lectures at all. The University had a tinge of Protestantism in it, but as far as my studies were concerned, it did not affect me a bit. I occasionally had an argument with some of my fellow students upon questions of religion. In the interval between mathematical discussions they sometimes used to turn to Theology, and I may say there was nothing that ever did me so much good, because when I found various points discussed, some of which I had never heard of before, I found it my duty to read the Catholic doctrine upon those subjects. My view is that this Catholic tinge of the University would not affect a single student who was not a Roman Catholic.

6542. You do not think there is any danger of history repeating itself, to the extent that the Bishops might take towards a Catholic University, or a University with a Catholic tinge, the same attitude that they took towards the Queen's Colleges?—I am perfectly certain that they would not—perfectly certain. The Bishops, as a body, never approved of the Queen's Colleges.

6543. There is one more question. You spoke with great emphasis of the importance of the teaching of Applied Science in respect of the national well-being—words which personally I was very glad to hear—and I understood that you were then speaking of the question generally, without particular reference to a Catholic University?—Certainly.

6544. Now, applying the matter to the case of Dublin, you propose, I understand, that in the newly-constituted College or University there should be a Faculty of Applied Science?—I do.

6545. What relation would that bear to the existing Colleges in Dublin? There is, as you know, the Royal College of Science, which, I understand, is likely to be considerably developed. Do you consider that in a city of the size of Dublin there is really room for duplication of the very expensive plant and appliances necessary for the teaching of such subjects?—My idea is that there is really no teaching of Applied Science of the highest standard in Dublin at all. My view is that Science, to be properly taught, must be brought up to the University. I think that the University training is the capping of education in reference to every branch of education. For instance, in reference to Applied Science, my view is that a man with a University Education will approach the question of Applied Science in a wholly different way from that in which the same subject will be approached by a man, although an able man, who has not had a University training; in other words, that there is something in a University training that will enable the mind to grasp, consider, and determine questions, in all Sciences and in all subject-matters of education, in a manner different from a mind not trained in a University. I would compare a University training to the sharpening of a knife. A knife so sharpened will perform a number of operations upon various subject-matters in a manner that never can be accomplished by a blunt knife. I consider that the sharp knife of the trained University man, when directed to Applied Science, will bring his knowledge to a point which cannot be reached by the untrained mind, although he may have a fair education in Applied Science.

6546. Then I gather that you would rather see the teaching of higher Applied Science concentrated in the University than, say, divided between the University and the Royal College of Science, or concentrated in the Royal College of Science?—I would wish that students from the Royal College of Science, when they have passed through their course there, should go to the University, or, perhaps, during some years of their course, they might at the same time be attending the University and the Royal College of Science. When I was in the University, during my last year—I am not quite clear that it was not for two years—I attended Law lectures there most diligently, and studied Law nearly to the same extent as I would have studied it had I not been in the University at all. According to my experience the mere study of such subjects as are necessary for a degree—take, for instance, Classics, Mathematics, Philosophy, Logic, and Ethics—are not enough fully to occupy the mind. I found that I had quite sufficient time accurately, and carefully, and scientifically, to study Law. I attended the lectures of a most able Professor, the late Mr. Mountiford Longfield, who was afterwards judge of the Landed Estates Court, and I felt the effect of his teaching to the last moment of my practice at the Bar, and I am not clear that I do not feel it even still. He presented the matter to me, not in the way you will find it in books; he analysed it and brought it to a science, lifting it, as it were, out of the small details of circumstances, and bringing it to a question of principle. Now, I should like to see that done in the matter of Applied Science. I do not think we shall ever have Applied Science properly taught in Ireland unless it is taught as a Science, and it is not easy to teach real Science to a mind that is not intellectually trained. I should look to the University for the purpose of giving that intellectual training; and combining the advantage of the intellectual training of the University, the sharpening of the mind, with the advantages to be derived from the Royal College of Science—against which I have not one word to say—you would more nearly than in any other way reach the perfection of education in Applied Science.

6547. Professor LORRAIN SMITH.—There is just one question I want to ask. I was much interested in your discussion of the question of safeguards. The point I wish to raise is this: I am not quite clear in my mind as to the essential difference between what you propose and that which is at present at work in the Queen's Colleges?—No. 8 of cap. 6 of the Queen's Colleges statutes contains these words:—". . . If a teacher or lecturer advance any doctrine or make any statement derogatory to the truths of revealed religion. . . ." Who is to say what are the truths of revealed religion? The teaching of the Catholic Church goes beyond what would be popularly understood as the truths of revealed religion. We consider that the Roman Catholic Church is the depository of revelation. We consider that that consists of two parts, or, rather, that it is gathered from two different sources. In other words, it is the teaching of our Lord, to be gathered, first, from tradition, and, secondly, from the Holy Scriptures. Well, if we put in the words "truths of revealed religion," we narrow that down in a way that some people will say excludes a mass of Catholic teaching. I myself do not think so, because I think that all revelation is within the meaning of the words "truths of revealed religion"—truths of revelation. But who is to determine whether a particular truth has been revealed or not? We believe in certain truths that other Christian Churches do not believe in.

6548. Yes; but might I not suggest that that is covered by what follows in the statute: as far as I recollect it; I have not got it before me.—(*Witness handed book to Professor Lorrain Smith*)—Is not that covered by the words, "or injurious or disrespectful to the religious convictions of any portion of his class or audience"?—That would hardly extend the former words.

6549. That extends to practically any form of religious faith; at least, that is my reading of it?—Yes, it does.

6550. And originally, in the constitution of the Queen's Colleges, there were Deans of Residence appointed to conduct the religious exercises of the students?—Certainly.

6551. Representing each form of religious faith?—I remember that.

6552. But I think it is extremely important for us, as considering how we may practically present a University constitution which will solve these difficulties, to consider in what sense we are modifying that which was originally adopted?—I think that to a certain extent we are modifying it. I will tell you the idea that was in my own mind. In my opinion that statute as framed was entirely right, having regard to the character of the Colleges, which I may describe as being neutral or colourless as regards religion. Whether right or wrong, the Roman Catholics are not satisfied with a College that is to be neutral or colourless as regards religion; and they claim to have a College or University in which there shall be a certain tinge of religion; that is, that one religion shall have a certain predominance over the other; that as there can be teaching of but one religion in the University, that particular religion should be the Roman Catholic one. That essentially modifies the character of the University. If it did not, there would be no necessity for this Catholic demand at all; the two things would be identical.

6553. Am I right in understanding the modification in this way, that whereas the old system which was introduced in the Queen's Colleges left all forms of religious faith on an equal basis, the Catholic claim

insists upon a predominance?—I think so; but at the same time I have no objection to anything that will prevent any statement injurious to any other religion being made. I do not want that any other religion should be attacked, but simply that there should be that colour of Roman Catholicism that is given in respect of Protestantism in Oxford, Cambridge, and Dublin.

6554. You say you have no objection to such a provision being added?—That no statement should be made which was injurious——

6555. To any religion?—I do not think, with the single exceptions of Moral Philosophy and History, there would be the slightest objection to it.

6556. The difficulty in my mind is to find any advance upon this statement, if you include other religions?—If there is no advance, and it is only a different form of words expressing the same idea, would it not follow, if there was no objection to that form of words, neither would there be any objection to my form of words?

6557. What I am anxious to do is to get a form of words to which there shall be the least possible objection on the part of anyone. You spoke about a University being a place of religion, and also a College, as a criticism of the Royal University. Of course, as long as it is an examining body, it could not possibly—?—As long as it is not a University at all—that really is the great difficulty. But I should think that gentlemen who are interested, as you are, in the Queen's Colleges would feel exactly as I do. If I were a Professor in a Queen's College I would most strongly resent that a body like the Royal University, upon which they were not represented, should be cribbing, cabining, and confining them, and taking away from them all their autonomy, and preventing the true development of education.

6558. I am sure we are all indebted to you for supporting us in that contention. But the point I was coming to was this: In what sense is the University, say, of Oxford a place of religion as distinct from the Colleges?—The University?

6559. Yes?—Does not the statute recognise it?

6560. Professor BUTCHER.—There is a University sermon?—I am taking the legal conception of the College; perhaps you are taking it as it is actually carried out, but we lawyers are very much given to ascertaining the character of a thing by its constitution, and seeing what is its character under its constitution. Now, take the recital of this Act, 34 Victoria, cap. 26:—

> "Whereas it is expedient that the benefits of the Universities of Oxford, Cambridge, and Durham, and that the Colleges and halls, now subsisting therein *as places of religion and learning*, should be rendered freely accessible to the nation. . . .
>
> "And, whereas it is expedient that such tests . . should be removed under proper safeguards for the maintenance of *religious* instruction and worship in the said *Universities*, and the Colleges and halls now subsisting within the same."

Those words, "*as places of religion and learning*," do not refer, according to my reading, only to the Colleges and halls of the Universities, but they include the Universities themselves. And as to the University of Dublin, I think that that is a place of religion too. There is a Professor of Divinity in the University of Dublin.

6561. To put the question in another way: Your ideal scheme was an affiliation of Protestant and Catholic Colleges in the University of Dublin?—That is my ideal scheme.

6562. Would not that convert the University into a colourless institution?—It would, and my answer is that the unfortunate state of our country renders it absolutely necessary. You have not got in Ireland the general body of the population professing one religion; you have it divided into two religions.

6563. My reason for raising the question is this: In any re-constitution or any practical solution of this question which is concerned with a University and with Colleges, do you regard it as essential that the University should retain that religious tinge?—The University as distinct from the College?

6564. As distinct from the College?—I do not, and I think the necessary result of having a second College in the University of Dublin would be that the University of Dublin would cease to be a place of religion. Of course, it would involve the question of the re-construction of the Senate, which involves a difficult matter, because I am personally aware that my friend, Dr. Salmon, the Provost, is not in favour of this. Therefore, I purposely refrained from mentioning anything as to the mode in which I would suggest that it should be carried out. All I wished was that the public in reading my evidence should not think that I, a Trinity College man, thought that the extension of University Education, which I deemed essential, could not be best carried out under my own University.

6565. Dr. STARKIE.—I have only one question to ask. I was glad that you stated so strongly that, in your opinion, a University, that was a mere Examining Board, was not a University in the proper sense of the word, and that you are in favour of a University being residential. But you said that, in practice, you thought it would probably be necessary to continue, at least for a certain number of years, the present system of examination that we have in the Royal University, chiefly in view of the fact that the opposite practice has so long prevailed, and presumably will continue to prevail, in Trinity College?—Certainly.

6566. Have you any idea what proportion of the students in Trinity College are non-residential?—I have not.

6567. Some of the Commissioners and some of the witnesses have considerably exaggerated the number of such students?—I have no idea as to the proportion. In my own time very few students used to come up for examination that we were not in the habit of meeting at lectures; it was very occasional.

6568. One witness stated, I think, that they are as numerous as almost fifty per cent?—That was not at all so in my time.

6569. But lately they have scrutinised the numbers in Trinity College, and it has been ascertained that there are less than twelve per cent. That is an important fact, I think?—I may say that I am entirely in favour of limiting the University degree either strictly to residential students or to students who attend lectures.

6570. Students who attend lectures—I call those residential?—It is practically the same. I hope that that will be accomplished, and accomplished in a very few years. But we lawyers, I am afraid, are very much given to protecting vested interests, as perhaps you know.

6571. I know, to my cost, I am afraid?—And this scheme that we have under consideration is a great scheme, and one—that is, if successful—which will, we hope, endure in perpetuity. Well, now, I am against increasing opposition to this scheme by any interference with vested interests, or by any rapid changes of former practice that can be set right at the end of a term of years. Let us have first established the thing that is essential, and gradually, time by time, with good and proper notice, we shall be able to train the habits of the people to the true idea of a University. The true idea does not exist in Ireland, in my opinion. When we have a population trained to that, then, gradually, we shall be able to avail ourselves of it, and to insist upon lectures for all.

6572. Personally, I should not like to have to postpone that millenium until we shall have succeeded in training the majority of the people of Ireland, because I think that would include an indefinite extent of time?—If you give me a charter, as I want it, I will take it at once, subject to that condition. But what I am afraid of is, that if you insist upon that condition, you may be bringing in people to oppose the scheme who otherwise would not do so.

6573. The vested interests in the case of examinations could hardly last for more than three or four years?—Four or five years. My idea is that the period of education before this University is in full working order can be calculated at about twelve years. Take a boy of about twelve years of age, who is now about entering upon his Intermediate course. I think the Intermediate course and all education will be changed by this. He will go through the Intermediate course, commencing at twelve years of age. That would occupy him, say, four years, and would bring him up to sixteen years of age. His University course to the B.A. degree would take him four years more, and would bring him to twenty years of age. Give him four years more that he would be working at his M.A. degree. He ought to be competent then to compete for a fellowship. His mind, at twenty-four years of age, would be in the finest state for intellectual development. Therefore I think that it will take twelve

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years before you have a fully educated body of graduates that will be respectable samples of University Education.

6574. Mr. WILFRID WARD.—I have only one or two questions to ask you. You lay considerable stress upon the constitution of the Visitorial Board?—I do.

6575. I want to be quite clear about its practical action. As I understand, the Bishops would sit as theological experts?—Yes.

6576. You think that, practically, it is very unlikely that their interference would ever be called for?—I do, certainly. I was called to the Bar in 1853—that is a period of forty-eight years ago; and during all that time, either as barrister or Judge, I have been aware of only two cases in which any question arose in reference to the doctrine of the Catholic Church. One was the celebrated case of Father O'Keeffe, which arose from the question of the Roman Catholic doctrine of a suspension *ex informata conscientia*. That, of course, could not arise with reference to the teaching in a University. The other was a case which I tried myself, as to the power of the Pope, with the consent of the Bishops of two adjoining dioceses, to transfer a parish from one diocese to another. That is the extent of my knowledge of any dispute as to Catholic doctrine having arisen in the Law Courts. As far as the Queen's Colleges are concerned, my recollection is that there was only one case—and that case arose, not in reference to any teaching, but the publishing by a Professor of a work. It was the case of Monsieur De Vericour, Professor of French in the Queen's College, Cork, who published a book which the Hierarchy said contained some unsound doctrine; and he put on the title page that he was Professor in the Queen's College. That is the only case I recollect in reference to the Queen's Colleges.

6577. I think it has been stated that in the Catholic Medical School in Dublin, which has been in existence over forty years, no such case has ever occurred?—I believe not. I may mention that I myself happen to be one of the Visitors of that Catholic School of Medicine, and if there had arisen any such question, it would, of course, have come to my knowledge; so that I can safely say there never has been any such case. I may be allowed to add that the teaching of Medicine is one of the very subjects in which such a question would be likely to arise.

6578. Judging from past history, does it not appear as if, at certain periods, Theology has suddenly changed its attitude, from a more or less passive one to an attitude of active criticism, when some new scientific theory emerges which is inconsistent with the prevalent form of theological teaching. Such a new theory is, for a time, supposed to be contrary to revealed truth. For instance, in the case of Galileo, he was at first believed to have propounded doctrines opposed to revelation, and absolutely heretical, though nobody thinks so now. And again, within our own memory, certain conclusions of Geology (*a*) were put forward which were condemned by theologians at the time, as contravening the Mosaic cosmogony?—But they have never been condemned by the Church.

6579. But many theologians considered them inconsistent with the teaching of the Church?—Yes; some theologians did so consider them, but I am not aware that they have ever been authoritatively condemned by the Church—certainly not in Ireland.

6580. Then, again, there is the doctrine of evolution. Many eminent theologians at first considered it inconsistent with the teaching of the Church as to creation?—I am quite aware of that, although, as I understand, it was propounded by St. Thomas and St. Augustin.

6581. What I wish to bring out is this: that it has only been as a result of a good deal of discussion among experts of both kinds—not merely theological experts, but also scientific experts—that at length a view is taken by theologians which is less stringent than was taken at first. Galileo was condemned at first as heretical; now his view is not considered heretical. In view of that fact, and of the fact that theologians cannot be considered as experts in Science when a new scientific theory is put forth, and, consequently, may misunderstand the nature and bearings of the theory, would you be prepared to allow that there should be a Court in which such a question of doctrine could be decided, with experts, both theological and scientific, to argue the case?—I do not think there would be any difficulty about that. Of course, I cannot speak for the Bishops; but, speaking personally, I think a great number of the Bishops would not have the slightest objection to allowing scientific experts to argue the question. But I think the Court ought to be a Court of Bishops.

6582. The Bishops should be the Court to decide the matter?—Yes. I do not see the slightest objection to allowing scientific experts to argue such a case, if it arose. Speaking for myself, I should be very glad if that were done.

6583. The reason I made the suggestion is that theological judges, such as the Bishops would be, have frequently taken a stricter view at first as to the tendency of scientific teaching than they have done afterwards, when the matter has been thoroughly explained and argued out. I am desirous of minimising the danger of an over-rigorous view on the part of theological judges from the outset?—I have not the slightest objection to the scientific experts being invited to explain and argue on any such questions. Of course, you are aware that the doctrine of the Church in reference to these matters is of the widest description. There is no teaching of the Church against evolution.

6584. Mr. WARD.—I quite agree. But theologians have sometimes thought otherwise.

6585. Most Rev. Dr. HEALY.—Allow me to ask you a question, to remove any misapprehension that might be created by some of the questions that Mr. Ward put to you. When you speak of the Bishops as being experts, I suppose you mean with reference to questions as to what is the clear, certain, and defined doctrine of the Catholic Church?—Certainly.

6586. You are perfectly aware, of course, that amongst theologians and philosophers, just as amongst lawyers, there is, on many questions, great difference of opinion?—I am quite aware of that.

6587. And that no Bishop has the slightest notion of undertaking to give a decision on those questions?—I am quite aware of that. They cannot do it.

6588. All that they undertake to do is to state officially and authoritatively what is the clear and certain teaching of the Church; nothing more?—Certainly. For instance, what Bishop could undertake to say which is the proper doctrine—the doctrine of the Dominicans, or that of the Jesuits, in reference to the question of the foreknowledge of God and of free-will?

Viscount RIDLEY.—We are very much obliged to you, my Lord Chief Baron, for the trouble you have taken.

The LORD CHIEF BARON.—I am extremely obliged to the Commission for the courtesy with which they have treated me.

The Witness withdrew.

At this stage of the proceedings, Lord ROBERTSON *took the Chair.*

Right Rev. Monsignor Molloy, D.D., D.Sc.

The Right Reverend MONSIGNOR MOLLOY, D.D., D.SC., Rector of the Catholic University, and Member of the Senate of the Royal University of Ireland, examined.

6589. CHAIRMAN.—Monsignor Molloy. I believe you are Rector of the Catholic University, and a member of the Senate of the Royal University of Ireland?—I am.

6590. You have, I believe, been so good as to arrange the points to which you propose to invite our attention, and therefore perhaps it would be the most convenient course if you would follow your own order in mentioning what you desire to lay before us?—Very well, my lord; I will follow the order of my notes, but I shall be very glad to answer any questions that may arise out of the evidence, as I go on. I think that the provision for University Education at present existing in Ireland, is not adequate to the needs of the Irish people. My views on this subject may be reduced to three propositions, which I submit for the consideration of the Commission. The first proposition is: That somewhat over-

(*a*.) See Cardinal Cullen's words, cited in question 1410, Appendix to First Report of this Commission.

70 per cent. of the best educated material, produced by the Secondary Schools of Ireland, and ripe for University Education, is made up of Catholic boys. The second proposition is: That this 70 per cent. of the best educated boys in Ireland, ought not to be debarred from their due share of the public endowments for University Education on account of their religious convictions. The third proposition is: That they are practically so debarred under the arrangements that at present exist. It seems to me that if these three propositions be established, it follows that some new arrangement ought to be made, by which this 70 per cent. of the educated boys of Ireland may enjoy the advantages of the public provision for University Education, without detriment or offence to their religious convictions. I propose to begin by giving evidence on the first proposition. The examinations of the Intermediate Education Board for Ireland practically control the whole of the education given in the Secondary Schools of Ireland. These examinations are divided into four grades—the Preparatory, the Junior, the Middle, and the Senior. For my present purpose I pass over the Preparatory and the Junior Grades. The examinations in the Middle Grade cover the whole range of subjects that are required for Matriculation in the Universities, and the standard of difficulty in that Grade corresponds pretty nearly to the standard required for the Universities. Therefore the boys who pass in the Middle Grade, and, still more, the boys who pass in the Senior Grade may be regarded as having reached the level required for entrance into the University.

6591. Which University is it that you refer to?—To both the University of Dublin and the Royal University, but especially to the Royal University. Now, the most successful boys in these two grades receive from the Intermediate Board recognition in the form of exhibitions and prizes; and therefore we may take it that the boys who get exhibitions and prizes in the Middle and Senior Grades, under the Intermediate Board, constitute the best existing material produced by the Irish Secondary Schools for a University course. I should like here to say that I do not regard the examinations of the Intermediate Board as an ideal test of education, but they are the only test we have. They are a very impartial test, and, taken at the lowest, they are a test, at least, of intellect and capacity. I wish, then, to show the Commissioners in what position the boys of the Catholic schools stand, when tried by this test.

I take the results of the examinations of the last year, published in September, 1901, and I confine myself entirely to the Middle and Senior Grades. In the Senior Grade there were thirty Exhibitions awarded, each of £50 for one year. Of these thirty Exhibitions, boys coming from Catholic schools got nineteen. In the Middle Grade there were fifty-six Exhibitions of £30 a year for two years. Of those fifty-six Exhibitions, Catholic boys got forty-two. Putting the two grades together, there were eighty-six Exhibitions awarded, and Catholic boys got sixty-one of them; that is, 70:93 per cent.

In this computation, I have considered only the highest prizes of the Intermediate Education Board, namely, the Exhibitions. If we take a wider range, and include all the money prizes and the book prizes as well, we arrive at practically the same result. The total number of Exhibitions, smaller money prizes, and book prizes given in the Senior Grade last year, was 115; and of these, Catholic boys gained eighty-one. In the Middle Grade, the total number was 195, and of that number, Catholic boys got 136. Adding these two figures together, we find that the total number of Exhibitions and minor prizes awarded in the two Grades was 310, and the number of those gained by Catholic boys was 217—exactly 70 per cent. All this is set forth in Table 1.

TABLE I.

Showing the Exhibitions and minor prizes won by Catholic boys at the examinations of the Intermediate Education Board, in the year 1901, in the Senior and Middle Grades, as compared with the total number awarded:—

—	Number awarded.			Won by Catholic Boys.		
	Senior Grade.	Middle Grade.	Total.	Senior Grade.	Middle Grade.	Total.
Exhibitions, ...	30	56	86	19	42	61
Minor Prizes, ...	85	139	224	62	94	156
Total, ...	115	195	310	136	81	217

This table shows that if Exhibitions only are counted, Catholic boys gained 70:93 per cent. of the whole; if both Exhibitions and minor prizes are counted, Catholic boys gained 70 per cent. of the whole.

Now, it is often said that the examinations of the Intermediate Education Board are not a test that a boy has been well educated, but rather that he has been well crammed. To a large extent I take that view myself, although I think that it has been sometimes exaggerated. But I should like to point out that this objection does not affect my present argument. The youth of Ireland had no choice in the matter; they had to take the system as it was offered to them. A certain task requiring intellect and capacity was put before them, and in the keen competition that ensued, nothing but exceptional talent, combined with persevering industry, could bring them to the top of the list. There is, however, one subject that cannot be crammed, and that is Composition. Moreover, it is generally recognised by experts that, as regards the Ancient Classics and Foreign Languages, skill in the art of Composition is one of the best tests of sound knowledge of the language. I thought, therefore, it would be interesting to the Commission, if I gave them some evidence as to how the Catholic boy had done in the matter of Composition. The material is at hand in the Report of the Intermediate Education Board; because it is the practice of the Board to award every year special prizes for excellence in Composition.

Beginning with Greek, I find that in the year 1901, with which I am dealing, there were five prizes awarded for Greek Composition in the Senior Grade. Of these five prizes, four were gained by Catholic boys. In the Middle Grade there were six prizes awarded, and all were won by Catholic boys. Thus, out of eleven prizes for Greek Composition, in those two grades, Catholic boys gained ten. In Latin Composition they were not so successful. They gained two out of four in the Senior Grade, and four out of five in the Middle Grade; that is, six out of nine altogether, in the two grades. In French Composition, four prizes were awarded in the Senior Grade, of which Catholic boys won two; and six were awarded in the Middle Grade, of which Catholic boys won all. In German Composition they won two out of three in the Senior Grade, and two out of three in the Middle Grade; in all, four out of six. In Italian Composition three prizes were awarded in the Senior Grade, and two in the Middle Grade, and Catholic boys won them all in both grades. Putting these figures together, it will be seen that out of forty-one special prizes awarded for excellence in Composition in the Ancient Classics and Modern Foreign Languages, Catholic boys gained thirty-three, or somewhat over 80 per cent. This is shown in tabular form in Table II.

TABLE II.

Showing the special prizes for excellence in Composition in Ancient Classics and Foreign Languages, won by Catholic boys at the examinations of the Intermediate Education Board, in the year 1901, as compared with the total number awarded:—

—	Number of Prizes awarded.			Won by Catholic Boys.		
	Senior Grade.	Middle Grade.	Total.	Senior Grade.	Middle Grade.	Total.
Greek, ...	5	6	11	4	6	10
Latin, ...	4	5	9	2	4	6
French, ... m	4	6	10	2	6	8
German, ...	3	3	6	2	2	4
I alian, ...	3	2	5	3	2	
	19	22	41	13	20	33

From this table it will be seen that out of forty-one special prizes awarded for excellence in Composition, in Ancient Classics and Foreign Languages, Catholic boys gained thirty-three, or somewhat over 80 per cent.

This closes all I have to say on the first proposition, namely, that more than 70 per cent. of the best educated material produced by the Secondary Schools of Ireland, and ripe for University Education, is made up of Catholic boys. I may add, however, that though I have not spoken of pass boys, the presumption is that our Catholic schools must have had about 70 per cent. of pas boys also; because it is not to be supposed that the proportion of pass boys to prize boys would differ very widely in the different schools.

LONDON.

Dec. 17, 1901.

Right Rev. Monsignor Molloy, D.D., D.Sc.

My second proposition states that this 70 per cent. of the educated youth of Ireland ought not to be debarred from their due share in the public endowments provided for University Education, on account of their religious opinions. By this I mean, that the public endowments should be made available to them, under such conditions as they can accept without detriment or offence to their religious convictions. This proposition, I think, will be generally admitted, on the ground of equal justice to all. The remaining 30 per cent. are already provided for in a manner which is consistent with their religious convictions. Why should the same advantage be refused to the 70 per cent.? But I should like to add a word in support of my view, on the ground of public policy. By the Local Government Act of 1898, the whole local government of Ireland has been placed in the hands of popularly-elected bodies—County Councils, District Councils, Borough Councils, and so forth—and it will hardly be questioned, I think, by anyone who knows Ireland, that in four-fifths of the country these elected bodies are chosen for the most part from the class to which the boys of the Catholic Secondary Schools belong. These Catholic prize boys, therefore, constituting, as I have shown, 70 per cent. of the best educated material produced by the Secondary schools are, in all probability, the future County Councillors and the future District Councillors of Ireland. Now, the point I would submit is this, that in the interest of the State, it is desirable that these young men, in whose hands so great a power is to be placed, for good or for ill, should have all the advantages of higher education which the State can afford to provide for them.

I now come to the third proposition, namely, that they are practically debarred from these advantages under the present arrangement. This is mainly a question of fact, and the facts, as I conceive them, are these. According to the present arrangements, the advantages of University Education, with State endowment, are offered to those only who go to the Queen's Colleges or to Trinity College. Now, the Catholic Bishops have condemned these Colleges as dangerous to faith and morals. They have not absolutely prohibited boys from going to them, but they have warned them of the danger, and they have advised them not to go. The Catholic people look to their Bishops as their spiritual guides, and the great bulk of them on strictly religious grounds, have acted in accordance with the admonition given by the Bishops. Thus they are debarred, on account of their religious principles, from the benefit of the State endowments, by reason of the conditions under which those endowments are offered to them. I should like to point out that it does not affect my argument, in this matter, whether the decision of the Bishops is wise or unwise, whether it is consistent or inconsistent; I only say that they have in fact given this decision, and that the people, in accordance with their religious principles, accept it as their guide, and act upon it. At the same time, I may observe that many eminent Protestants, looking at the question from their own point of view, have plainly expressed their sympathty with the action taken by the Bishops.

As a contrast to the attitude taken up by Catholics with respect to the Queen's Colleges and Trinity College, I should like to point out the great success which has attended the establishment of the Intermediate Education Board in Ireland. What is peculiar with respect to the endowments administered by that Board is, that they are offered to the schools without any interference whatever with the system of education given, further than this, that the secular education, for which alone the endowment is provided, is tested by an independent examination. And the result has been that all the Catholic schools in Ireland send their pupils up for these examinations. That is a proof of the desire that exists amongst the Catholics of Ireland for education, and it is a guarantee of the success likely to attend any new arrangement, which shall offer University Education on conditions that leave the teaching of the Catholic Colleges free.

That finishes what I have to say on the general University Question. And perhaps it might be well if I were to answer any questions that may arise out of that portion of my evidence, before proceeding to deal with the second head, which has reference to the Catholic University Medical School.

6592. Viscount RIDLEY.—I have only one question I should like to ask you. You have given us some very eloquent facts about the way in which Intermediate or Secondary Education is taken up by the Catholic youth of Ireland, and apparently they come to this, that the Catholics get prizes quite up to their per centage of the population?—Not altogether up to their percentage of the population, but very little below it.

6593. But practically that is so?—Yes; the percentage I have made out is 70; I think the percentage of the Catholic population is 74.

6594. Then, practically, although they are the poorer class of the population, yet the number of prizes and distinctions that they get is equal to the proportion they bear to the population?—Yes.

6595. I wanted only to ask you this: You speak of the desirability of giving them the advantages of University Education. What proportion of these young persons do you think would have any chance of a University career? I mean, do you contemplate a very large proportion of them going on to the University?—You mean on the supposition that equal advantages would be offered to them as are now offered to other denominations.

6596. Is there not such a thing as overstocking a University?—Not with Catholics, at present.

6597. No; but admitting your contention for the moment, and, of course, giving the same opportunities to Catholics, that now exist for Protestants, I want to ask you whether, from the class of population and the kind of employment they are likely to get if they go for a University Education, is there not such a thing as overstocking a University—whether with Protestants or Catholics, I do not care—from the point of view of their future life?—The view I take is, that at present 30 per cent. of the boys qualified by their education for a University career, have full and free access to all the advantages of University Education, while 70 per cent., equally well qualified, are debarred from these advantages. What I advocate is that full and free access should be afforded to the 70 per cent.

6598. Is it quite correct to say that the 70 per cent. are debarred, because after all you have the Royal University and you have the University College in Dublin?—No doubt, the 70 per cent. are freely admitted to the degrees of the Royal University, but there is no provision made by the State to afford them an opportunity of getting the University Education necessary for the purpose of obtaining degrees.

6599. Except at Maynooth?—That is only for ecclesiastical students; and the provision made there is mainly for a professional training.

6600. The gist of my question was this: What proportion do you think of the young men in whom you are so much interested would really, for all practical purposes, supposing they had it open to them, be able to take advantage of a University career?—Your lordship must see that it is difficult to answer that question, because it involves a certain element of prophecy. But I have considered the subject, and I am ready to give my views on it to the Commission, guarding myself by the observation that no one can foresee the future, in a matter of this kind, with any degree of certainty.

6601. I do not wish to press the matter any further?—The first point I would call attention to is this, that if the same proportion of that 70 per cent. came up to the University as comes up from the 30 per cent., we should have seven Catholic University students, as against three from all other denominations. No doubt many persons think that a much smaller proportion of the 70 per cent. than of the remaining 30 per cent. would go on for a University Education. This is said so often that it has become a sort of catchword, but I have never heard any sufficient reason alleged for it.

6602. Have you any idea of what the proportion in Scotland is—the Scotch is, I believe, a very high proportion; but do you know what the figures are?—I do not know the exact proportion in Scotland, but I was going to refer to Scotland as giving us a means of judging what we might expect in Ireland. In Scotland you have the masses of the people filled with a great desire for learning, and you have exactly the same desire among the people of Ireland; and so I should expect that in Ireland, as in Scotland, you would find a very large number of boys in the middle class eager to seize the advantages of a University Education, if the opportunity were afforded them. I was going to make a calculation, if I may, always understanding that it is largely a matter of speculation. If the same proportion came up from the 70 per cent. as come up from the 30 per cent., we should have seven University students to every three from all other denominations taken together. But I am ready to make a considerable

reduction upon that proportion; and having considered the matter carefully, my own conjecture would be that the proportion would not be seven to three, but four to three; that is, we should have four University students for every three from all other denominations. In support of that opinion, I should like to point out that though the boys of the Catholic Secondary Schools come from a somewhat poorer class, taken all round, than the boys of the other schools, they are not paupers. In large measure, they are the sons of professional men, of strong farmers, and of well-to-do shopkeepers. I admit that in Ireland the Catholic gentry is small as compared with the Protestant gentry, but the Catholic middle class is very large as compared with the Protestant middle class. Moreover, everyone who knows the people of Ireland is aware that the parents of these boys have made great sacrifices, and are ready to make still greater sacrifices, to obtain for their boys the best possible education they can get to advance them in life. I have spoken of the position of the class from which these boys come. They are, many of them, the sons of County Councillors and District Councillors, brought into existence under the Local Government Act. These men have shown remarkable intelligence and business capacity in the discharge of their duties, but they have undoubtedly felt that they lack the great advantage of a University Education; and they would be extremely anxious to secure for their sons that advantage which was denied to themselves. Taking these considerations into account, I would fix the proportion of University students who may be expected to come up from our 70 per cent., as compared with the proportion that come up from the 30 per cent., at four to three. Now, let us see how that would work out. I put down the number of University students in Ireland who are not Catholics, roughly speaking, at 1,500. I could give the particulars, but I think that that figure may be taken as roughly accurate; if anything, it is a little under the mark.

6603. 1,500 non-Catholics?—About 1,500.

6604. How many Catholic students are there now?—That I have not considered in connection with this argument, but if you will allow me I will come to it a little later on.

6605. Do you include them in the proportion of four to three?—No; in suggesting the proportion of four to three, I am speaking of the future.

6606. That does not mean four extra students; that would include those who come up now?—Certainly.

6607. Dr. STARKIE.—Would the 1,500 mean 1,500 residential students?—No. If you like I will give you the figures which I have here. In 1899-1900, there were 1,072 students in Trinity College. Of those, about seventy were Catholics. I put down then 1,000 non-Catholic students for Trinity College. There is no difficulty about the Queen's Colleges, because the reports of the Presidents give us the religious denominations of all their students. In Belfast I put down approximately 300 non-Catholic University students; in Queen's College, Cork, 77; in Queen's College, Galway, 58. Then there is Magee College, which has a certain number of University students, and there are a number of students following the Royal University course—non-Catholic students—who do not belong to any of these Colleges. I put these down altogether at 100, and my tot gives me 1,535. Lest I should have exaggerated in anything, I have cut off the thirty-five as a margin for safety, and so I think I am somewhat under the mark, when I put down the number of non-Catholic University students in Ireland at 1,500. If in the future we were to have four Catholics for every three of these, we should have 2,000 Catholic students. I do think that 2,000 would be a moderate estimate of the number of students we should have—not all at once—but when the system had come into full operation, and free scope had been allowed for its action, say at the end of ten years.

Now, there is a way of checking this figure, which perhaps to some members of the Commission may appear a little extravagant, by considering how many Catholic students we could count upon at once, in the first year or two of the operation of the new system. I have made an estimate of this number, on the supposition that a satisfactory Catholic University College were established in Dublin. At present, in University College, Stephen's-green, there are in Arts and Science about 200 students, including the students in the evening classes; in the Catholic University Medical School there are 260; in other Catholic Colleges, which carry on University classes in connection with the Royal University—such as Blackrock, Carlow, and others—there would be some forty or fifty. Moreover, if there were a Catholic College opened in Dublin, under conditions satisfactory to the Catholic Bishops, there would be at once a very large accession, I am quite sure, from Maynooth College. There are 200 students, or thereabouts, reading a higher course of Arts in Maynooth, and the necessity for their obtaining degrees will be felt immediately upon the establishment of any satisfactory Catholic University or College in Dublin. I believe that in the long run all these students would go through a University course in Arts, but I think we might calculate at the outset upon 100. Perhaps it might be interesting to the Commission if I stated why I feel confident upon this subject. Each of our Bishops has a diocesan seminary to train students in his own diocese for the priesthood. These seminaries are practically manned by priests. When the students have read a preparatory course in Arts in the Seminary, they go up to Maynooth, where they read a higher course of Arts. Now, under the new order of things, in which degrees would be obtained under conditions satisfactory to Catholics, I feel confident that the Bishops would find it necessary to have, as their Professors, men of University standing; because I do not think the seminaries could hold their position in the educational world, if the Professors were not men of University standing. They get their Professors from amongst the young priests who are educated in Maynooth; therefore the necessity will inevitably arise that these young priests should have University degrees. On that ground I calculate that we should have at least 100 University students from Maynooth, even at the outset. One more element that would contribute students, would be the religious orders. In Ireland the religious orders have a large number of Secondary schools and Colleges dotted over Ireland, and their own members are largely the teachers and Professors in these Colleges. Under the new order of things, they could not maintain their position, if their Professors had not University degrees; therefore, they would feel compelled to take the first opportunity afforded them of getting degrees for their young students, in order that these students might afterwards be fit Professors for the schools and Colleges. I put down, under this head, 100 students. That will tot up altogether, as I make it, to somewhere about 700. That number, I think, we could have at the very outset, on the supposition of a satisfactory Catholic College, with degree-giving power, being established; but it would, I think, in a few years rise to 1,000; and in the course of ten or fifteen years, I have very little doubt that my estimate of 2,000 would be reached.

The Commission adjourned until the following morning.

SEVENTEENTH DAY.

WEDNESDAY, DECEMBER 18, 1901.

LONDON
Dec. 18, 1901.

AT 11 O'CLOCK, A.M.,

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman); The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.; The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.; Sir RICHARD CLAVERHOUSE JEBB, LITT.D., LL.D., D.C.L., M.P.; Professor S. H. BUTCHER, LITT.D., LL.D.; Professor J. A. EWING, M.A., LL.D., F.R.S.; Professor JOHN RHYS, M.A., D.LITT.; Professor J. LORRAIN SMITH, M.A., M.D., WILLIAM J. M. STARKIE, Esq., LITT.D.; WILFRID WARD, Esq., B.A.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

Right Rev. Monsignor Molloy, D.D., D.Sc.

The Right Reverend Monsignor MOLLOY, D.D., D.SC., Rector of the Catholic University, and Member of the Senate of the Royal University of Ireland, further examined.

6608. The CHAIRMAN.—When we adjourned last evening, Dr. Molloy, you stated that, in your opinion, if a satisfactory Catholic College, with degree-giving power, were established, the number of students would, in a few years, rise to 1,000, and that in the course of ten or fifteen years, you had very little doubt that your estimate of 2,000 would be reached?—Yes, my lord. I should like just briefly to sum up what I said on this point. Under the stimulus given to education by the Intermediate Education endowment, the Catholic Secondary Schools have succeeded in producing practically 70 per cent. of the best educated material, ripe for University Education, turned out of the Secondary Schools of Ireland, as compared with 30 per cent produced by all other denominations. Making that the basis of what we may expect would be the number of University students, I say that if we were to suppose that the same proportion of our 70 per cent. would go on to a University career, as would go from the 30 per cent., we should have a proportion of seven to three. But I put the ratio much lower than that—I put it at four to three; and on that ratio I estimate, when the system has had full scope for its operation, that our numbers would be 2,000. The number of University students of all other denominations is at present 1,500, and, therefore, if we had four to three, we should have 2,000. It would be interesting, I think, to the Commission if I were to illustrate this estimate from the case of Belgium. The population of Belgium is 6¾ millions, and out of that 6¾ millions, there are 5,200 University students. The population of Ireland is now about 4½ millions; and, supposing the same proportion of students would go on to a University career in Ireland as in Belgium, the number would come out about 3,500. Now, it is curious that this number corresponds exactly with my estimate, arrived at by a different process. My estimate is 1,500 non-Catholics, and 2,000 Catholics, making together 3,500. As I said yesterday, I do not expect that we can reach that total for several years to come, but I showed that we could point to about 700 as immediately available to start with. That number, I expect, would rise, within two or three years, to about 1,000; and, at the end of ten or fifteen years, we might reasonably hope for 2,000. I have not the figures for Scotland, but I think we may learn from Scotland at least one lesson—that the general poverty of a population is no argument against there being a large number of University students, if you have a keen desire for education amongst the mass of the people. Scotland also shows us this, that the wide extension of University Education is beneficial to the nation, and the Empire, even though it take place amongst a poor population.*

6609. Most Rev. Dr. HEALY.—Monsignor Molloy, I am very glad you made that last observation, because I was afraid there was a little apprehension growing up in the minds of some people that we might have too many University students in Ireland, and we have it now, on your authority, that that is not likely to be the case. There are not too many University students in Scotland in your opinion?—No; I think that the wider education of every kind is extended the better.

6610. And you think it has been greatly beneficial to that poor country, and greatly beneficial also to the Empire?—I think so. In saying that, I only reflect the general opinion.

6611. And you hope, I suppose, that a similar extension of University Education in Ireland may ultimately prove equally beneficial to the country and the Empire?—I not only hope so, but I am perfectly confident of it.

6612. And you expect and hope that provision should be made, not merely by having a well-equipped and well-manned University or University College, but also by Bursaries and Scholarships, in the University or University College, which would be instrumental in helping on deserving students to make their way to the highest eminence in a University career?—Certainly, that is a very important feature in all Universities intended for the general body of the people.

6613. And especially so in a poor country like Ireland?—Yes.

6614. Sir RICHARD JEBB.—The only question that I want to ask you, Monsignor Molloy, is this—whether you think the better endowment of the College in Stephen's Green would be an adequate solution of the question, if that College remained a College of the Royal University?—Certainly not, unless by "better endowed" is understood a very wide extension of endowment.

6615. I mean such an endowment of the College in Stephen's Green as would make it in every respect an efficient instrument of University Education?—But it could not be done in Stephen's Green; there is no space.

6616. You think that that solution would not be adequate. Then would you contemplate a new University altogether for Roman Catholics?—Before leaving the first point, I should like to be allowed to say that no endowment of the College in Stephen's Green would meet the case, because there is no space there for a University College of the size required. There must be a new site, and new buildings.

6617. I have been under the impression that there was some ground available for the extension of the Stephen's Green College?—No, there is no ground available, except a small garden, which would not be sufficient for such a College as I contemplate.

6618. Then, what do you consider would be a satisfactory solution?—That is a very difficult question to answer, because if I were to give you what I consider to be the best solution, I might appear to ask something which would be impracticable. My experience is, that in this country, the State seldom aims at finding the best solution for any difficulty, but, rather, the

*I have since ascertained the number of matriculated students following a University career in Scotland, in the year 1897-8, is as follows:—Edinburgh, 2,780; Glasgow, 1,836; Aberdeen, 776; St. Andrew's, 368; total, 5,760. If we deduct from this total the number of women students, which is about 560, we get 5200, as the number of male students. The population of Scotland according to the late Census was 4,472,000, and of Ireland, 4,456,546. These figures seem to show that my estimate of 3,500, as the number of University students we might expect to have in Ireland, under conditions as favourable as those that exist in Scotland, rather errs on the side of moderation than of excess.—G. M.

second best, or the third best. Therefore, if I were to give you what I should regard as the best solution, I might appear to be unreasonable.

6619. Would you mind indicating to the Commission the best solution that you think practicable?—When we come to consider what is the best practicable solution, the difficulty is even greater. It seems to me that no solution is practicable unless one which the Government is willing and able to pass through Parliament. Now, I do not know what solution of the Irish University question the Government is able and willing to pass through Parliament. Therefore, it is impossible for me to tell what is the best practicable solution. I do not wish to evade the question, but onl yto point out the difficulty it involves. If any suggestion I can make would help the Commission to arrive at a satisfactory conclusion, I should be very glad to give it.

6620. CHAIRMAN.—I may say, in confirmation of what Sir Richard Jebb has said, that I think you may lay aside all questions of practicability from the Parliamentary point of view, because we wish to have all the suggestions—and those which we have already received have been accepted in that spirit—of responsible persons, apart altogether from considerations of their Parliamentary practicability. Now, putting that on one side, will you be good enough to give us the benefit of your views?—What kind of practicability, then, am I supposed to deal with?

6621. I did not introduce the word "practicability." I thought you did?—I think it was Professor Jebb who first used the word.

6622. Sir RICHARD JEBB.—I did not use the word "practicability" in the sense in which the word seems to have been understood by you. What I asked you was what was the best solution you could conceive as possible and practicable?—I have said that I can conceive no scheme as practicable unless the Government is willing and able to carry it through Parliament. But, if the Commission desire to know what I think they might with advantage recommend in their Report, I am quite prepared to go into that question.

6623. CHAIRMAN.—Perhaps you will kindly give us your views upon that point?—It seems to me that the immediate and urgent want at present in Ireland is to provide a University College for that large body of Catholic students, which I have proved to exist, and which is practically debarred at present from sharing in the public endowments for University Education. I would define this College as a Catholic College, or a College that will be practically Catholic in its administration and its teaching. It ought to be established in Dublin, on a scale comparable, at least, with Trinity College, and it ought to be provided by the State with a site and buildings, and equipment, suitable for the work which it is intended to do, and also with a permanent endowment to provide for the payment of the teaching staff, for the maintenance of the buildings, and for the foundation of the usual Bursaries, Exhibitions, and Scholarships. That is, in my opinion, the immediate and urgent want in Ireland, and it would seem to me that a great point would be gained if that were put in the forefront of the recommendations made by this Commission. But there are certain questions which, of necessity, arise, subsidiary to that, and which seem to involve considerable difficulty. One of these is the question of the University to which this College should be attached, and another is the constitution of the Governing Body of such College or University. With regard to the first, I think that the consideration of the question is greatly hampered by the fact that the University of Dublin is excluded from consideration. But I accept that as a settled matter, and I pass from it with this remark only, that it would seem to me to be quite possible, if it were once decided that Catholics were to have such a College as I have described, that then the University of Dublin would not only be willing, but might be found anxious, to consider from a national and academic point of view, on the basis of the existence of such a Catholic College, what would be the best settlement of the question as regards the University. However, having thrown out that suggestion, I now pass away from all consideration of the University of Dublin, and that being excluded, there are really only two alternatives. One is the alternative of erecting the Catholic College into a University, which would grant its own degrees, and be entirely "self-contained," as the phrase is; the other is the alternative of making it a College under the Royal University. I see certain advantages and disadvantages in each of these alternatives; but, having balanced them, one against the other, I have come to the conclusion that the better alternative, from an educational point of view, is to erect the Catholic College into a self-contained University. The main objection I have to the alternative of a Catholic College under the Royal University is that, owing to the keen, the almost feverish, competition, which has been set up between different Colleges connected with the Royal University, the prominent idea before the minds of students and Professors is that successful competitive examination is the be-all and the end-all of University life. That I regard as a false standard of education, and one which it would not be desirable to make permanent in the country. A second point, and, I think, it arises out of the first—is that, under the system of the Royal University the position of the teaching staff in the several Colleges is reduced to a very low status. Instead of being University Professors, they are little more than a body of College "grinders." Consequently, they are not in a position, no matter how high their qualifications, how good their intentions may be, to give their best work to their Colleges. They are practically compelled to do only an inferior sort of work, because the one thing expected and required of them is that their students shall pass the examination, and that the largest possible number shall get honours and distinctions. I do not wish to say one ungracious word against the Royal University of Ireland. I think the Senate has carried out the task imposed upon it with great ability, and with extraordinary success; and I would add that the Catholic Colleges owe a great deal to the Royal University, because, under it, they have had an opportunity of showing that they are able to hold their own in the keenest competition with the most distinguished students of the endowed Colleges. It is, moreover, true that the high position which Catholics now hold in Ireland, in connection with the question of University Education, is largely due to the opportunities which have been afforded to them in the Royal University. But when all that is said, the fact still remains that the system embodied in the Royal University is unsound from an educational point of view, and I should be sorry to see it made permanent as representing the ideal of University Education in Ireland.

6624. Professor EWING.—What relation would be borne to the proposed College by the existing University College in Stephen's-green?—What I should contemplate would be that a new College should be created and endowed as a College of Arts, Science, Medicine, and all the other faculties of a University.

6625. Would the present Catholic College in Stephen's-green submit to such an adoption?—Certainly, if the new scheme were satisfactory to the Bishops. Perhaps I ought to explain the present position of University College in Stephen's-green. It was founded by the Catholic Bishops of Ireland, and is their property. The administration of it, for the present, has been handed over to one of the teaching Orders, because the Bishops had no longer funds with which to carry it on. But on any settlement of the University question, the Catholic Bishops of Ireland would be the body to decide what was to become of University College; and of course if they were satisfied with the new scheme, they would accept such a College as I have described instead of the existing College in Stephen's-green.

6626. And would you contemplate any co-operation between the new College and such an institution as the Royal College of Science?—I have not contemplated that.

6627. Speaking in the interests of the teaching of Applied Science, more particularly it has been suggested that it would be a pity to set up in a city like Dublin a complete duplicate machinery for the teaching of Science, that it would be a waste of public funds, and would probably lead to neither of the two institutions being so efficient as a single institution would be?—A great deal would depend upon a question which has not yet been fully considered, much less decided, namely, whether the ideal University teaching of the future would include Technical Education, or whether it would stand apart from Technical Education, as it has hitherto done in the older Universities. If, in the future, Universities are to give not only a general education, but also the highest form of Technical Education, then I should see no necessity for duplicating the Colleges and duplicating the apparatus. But if the new College is to follow the lines of the older Universities, and to teach Science mainly from the mere theoretical point of view, then I think the duplication of the apparatus would be necessary. There would be, in fact, two kinds of Colleges, one teaching Science, considered in itself, the other teaching the application of Science to the industrial Arts.

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6628. If they had that difference of function, then, of course, the question answers itself?—Yes.

6629. But I was rather contemplating a case where a College established to discharge the general functions of a University would consider itself incomplete unless it had, not merely a Faculty of Applied Science, but also machinery for its practical teaching?—I should consider it incomplete as a University College if it had not within its walls a Physical and Chemical Laboratory.

6631. Quite so. I was contemplating such subjects, for instance, as Engineering being taught?—I think Engineering might very well be taught in the Royal College of Science.

6631. And omitted from the new College, as you contemplate?—I should not like to consent to omit anything unless I had the complete scheme before me. I do not think there would be any difficulty with regard to such a subject as Engineering, but I should not like to commit myself to any statement as to what may be omitted from the teaching provision of the new Catholic College without seeing the scheme under which it was to be done.

6632. Do you see any objection to the working of a scheme by which the new Catholic College could be associated with the Royal College of Science in Dublin, so that pupils having received their special training in the one could pass on to the other—do you see any objection to such an arrangement as that?—If such a scheme were adopted for other Universities, and made as it were the normal system in the United Kingdom, I should see no objection to it from the Catholic point of view. But if the new Catholic College, endowed by the State in Ireland, were to be deprived of functions exercised by other University Colleges, such a distinction would imply a certain inferiority.

6633. CHAIRMAN.—I would invite you now to pass to the second part of your statement?—I wish to lay before the Commission a few facts as to the present position and working of the Catholic University School of Medicine. The Catholic University School of Medicine stands on a footing somewhat different from that of University College in Stephen's-green. It is managed by a Board of Governors,* created by an Order of the Lord Lieutenant in Council, under the Educational Endowments (Ireland) Act of 1885. This Board of Governors is a Body Corporate, with perpetual succession and a Common Seal, and it has power to acquire and hold property, real and personal, for the purposes of the school. Thus, the Catholic University School of Medicine has a legal position in the eyes of the State, comparable with that of the other Medical Schools in Ireland, governed by chartered bodies. I propose to tell the Commissioners, very briefly, how this has come about.

The School was founded by the Catholic Bishops of Ireland in the year 1855. The buildings were purchased and equipped out of monies collected from the people of Ireland, then just recovering from the effects of the great Famine. The teaching staff were paid for many years by means of an annual collection made for the purpose, and the cost of maintenance was met partly out of the same annual collection, and partly out of capital. But about twenty years ago, the Capital Fund of the University was exhausted, and it was found no longer possible to continue the annual collection. Since then the Professors have received no salaries, and the cost of maintaining the buildings and equipment has been a first charge on the fees paid by the students. What remains of the fees, after this charge is defrayed, is divided between the Professors and lecturers, according to a scheme arranged by the Faculty, and approved by the Governors.

In the year 1891, the Bishops gave their consent that the School and its endowments should be dealt with by the Educational Endowments Commission, constituted under the Act of 1885. A scheme was accordingly prepared by the Commissioners for the future administration and government of the School, and this scheme, after passing through the various stages provided by the Act, was finally approved by the Lord Lieutenant in Council, on the 24th of May 1892. The endowments transferred to the new governing body, were: (1) the buildings and equipment of the School; (2) a sum of £1,000 part of a bequest at the time in the hands of the Bishops for the purposes of the Catholic University; and (3) £500, Bank of Ireland Stock another bequest, yielding about £55 a year. This was the sum total of the endowments with which the School was launched on its new career. The sum of £1,000, just mentioned, together with £3,000 more, which was soon after acquired from another source, was spent by the new governors in improving the buildings and equipment of the School; and the income of the Bank of Ireland Stock was allocated to prizes for the students. Accordingly, the buildings and equipment, as they now stand, and the small income of £55 a year, constitute the sole endowment of the School.

Now, to understand the position of the School, we must consider it in relation to the other Medical Schools in Ireland. There are altogether six Medical Schools in Ireland: three in Dublin, and three in the provinces. The three in Dublin are Trinity College, the College of Surgeons, and the Catholic University School. The three in the provinces are those of Queen's College, Belfast; Queen's College, Galway; and Queen's College, Cork. All these Schools, with the single exception of the Catholic University School, have received large endowments from public funds. The schools of the three Queen's Colleges, with which the School of the Catholic University is brought into direct competition under the Royal University, were all built and equipped out of public money; the salaries of the Professors are paid by the Imperial Treasury; and from the same source an annual grant is made for the working expenses and maintenance of the Schools. Moreover, special grants are made from time to time, for additions and improvements, as occasion requires. For example, in the years 1891-1894, Belfast Queen's College received special grants amounting to £7,842, chiefly for its Chemical department.

The number of students in the Catholic University School of Medicine has been rapidly increasing of late years, especially since the creation of the new governing body, in 1892; and I am informed that it is now the largest of all the Medical Schools in Ireland as regards the number of its students. I have asked for a return showing the progress of the School in this respect, as compared with the other Medical Schools, and I have been told that the most authentic evidence on the point, applicable to all the Schools, is furnished by the number of new students, of each School, registered each year by the General Medical Council. Accordingly, I have prepared a table showing how this register stands, for the last five years, for all the Irish Schools except Trinity College, which is excluded from the inquiry.

TABLE III.

Showing the number of new students registered from each of the Irish Medical Schools (except Trinity College), in each year from 1896 to 1900 inclusive.

—	Catholic Univ.	Coll. of Surgeons.	Belfast.	Cork.	Galway.	Total.
1896, ...	43	59	47	42	9	200
1897, ...	45	38	49	22	8	1 2
1898, ...	55	35	38	37	10	175
1899, ...	50	50	50	38	13	201
1900, ...	72	43	46	32	10	203
Total.	265	225	230	171	50	941

I daresay the members of the Commission understand that the Medical education of the kingdom is controlled by the General Medical Council, which has its seat in London, and that no Medical student gets credit for any lectures he attends until he is registered. Consequently it becomes a necessity for every Medical student to register his name as soon as he begins his Medical course, and in registering his name he also registers his school. The result of this registration is published every year about the month of February, by the General Medical Council, and the table which I have submitted has been taken from their official reports. It extends over a period from 1896 to 1900 inclusive, and it will be seen that at the beginning of that period the School of the Catholic University was below the College of Surgeons, below Belfast, and about equal to Cork. But in the year 1899 it was exactly equal to the College of Surgeons, exactly equal to Belfast, and above Cork. In 1900 it was the first of all.

Another kind of evidence bearing on the question is furnished by the number of students in each school who are engaged in Practical Anatomy, commonly called "dissections." This information, however, is available only for the Dublin Schools, and perhaps I ought to explain exactly how it becomes available. Of course, dissections cannot be carried out without material to dissect, and the providing of this material is always a difficult matter with Medical Schools. In Dublin the arrangement is that a small Committee meet together at the beginning of the year, consisting of the Professors of Anatomy in the three Schools. They give a return of the number of students, each one for his own School, who will be engaged in dissections during the coming

* See page 293.

year, and they pay a fee into a common fund, of one guinea for each student. Consequently, we get an authentic return of the number of students engaged in that particular branch of Medical study during the year. That return, however, is only available for the three Dublin Schools, and, as before, in giving it I leave out Trinity College; it is reduced, therefore, to two—the Catholic University School and the College of Surgeons. It will be seen here again that we have evidence of the progress of the Catholic University School. In the beginning of the period covered by the table, 1896-1897, it had only 118 students returned for dissections, as against 170 in the College of Surgeons; whereas at the end of the period the Catholic University had 162, as against 130 in the College of Surgeons; the rise being very considerable in the last year.

TABLE IV.

Showing the number of students "returned for dissections," in each of the Dublin Medical Schools (except Trinity College), in each year from 1896 to 1900 inclusive.

—	Catholic University.	College of Surgeons.
1896-7, ...	118	170
1897-8, ...	115	150
1898-9, ...	113	141
1899-00, ...	123	130
1900-01, ...	156	125

Of course, the most direct evidence upon the subject, would be the actual number of students attending the Medical courses, in the different Schools, each year. That return we have not for either of the other Dublin Schools, but I have obtained it for our own School from the Registrar. We have also a return from all the Queen's Colleges, which publish their numbers with great exactness every year, in the appendix to the reports of their respective Presidents. As these figures are very easily accessible, I thought it would be interesting to lay before the Commissioners a table showing the progress of these four Medical Schools over a lengthened period, beginning in 1886 and coming down to the present time.

TABLE V.

Showing the number of students attending lectures in the Medical Schools of the Catholic University, and of each of the three Queen's Colleges, in each year from 1886-1887 to 1900-1901:—

—	Catholic University.	Belfast.	Cork.	Galway.
1886-7, ...	105	240	176	45
1887-8, ...	108	227	177	40
1888-9, ...	120	222	172	42
1889-90, ...	153	250	167	46
1890-91, ...	158	229	180	37
1891-92,* ...	183	270	199	38
1892-3, ...	158	213	200	41
1893-4,† ...	201	248	195	46
1894-5, ...	203	212	172	54
1895-6, ...	195	228	168	34
1896-7, ...	200	227	164	32
1897-8, ...	195	223	138	20
1898-9, ...	210	206	137	29
1899-00, ...	203	214	135	39
1900-01, ...	260	226	130	29

* This was the last year in which students could enter for the four-years' course. All students beginning their medical career after 1891 have been obliged, in accordance with the regulations of the General Medical Council, to follow a five-years' course.

† This was the first year after the new Governing Body of the Catholic University Medical School came into office. It shows a great increase in the number of students in that School, which has remained permanent ever since.

It will be seen from a glance at the list, that the Catholic University School, and it alone, has progressed during that period, as regards the number of its students. In the first year of the period the number was 105, in the last it was 260. But sometimes there may be a deception in taking a single year, and I thought it better, therefore, to take the average of the first three years, and of the last three years, of the period over which the lists extend. This is given in Table VI., which shows us that in the first three years of the period, the average number in the Catholic University School was 111, and in the last three years 224. Belfast in the first three years was 220, and in the last three years 215; Cork in the first three years 175, and in the last three years 134; Galway in the first three years 42, in the last three years 32. If the Commissioners will look at the last column of the table, they will see that the total number of students in these four Schools has gone up during the period; but the increase is entirely due to the increase in the Catholic University School; all the others have fallen off.

TABLE VI.

Showing the average yearly attendance of students at each School during the years 1886-1889, as compared with the attendance in the years 1898-1901:—

—	Catholic Univ.	Belfast.	Cork.	Galway.	Total.
1886-9, ...	111	230	175	42	558
1898-1901, ...	224	215	134	32	605

There are some other points in Table V. to which I should like to call attention. Between the two years 1890-1891 and 1891-1892, there is a sudden jump up in all the Schools; but that rise, though interesting, has no real importance. The year 1890-1891 was the last year of what is called the Four Years' Course. Up to that time, and including that year, the General Medical Council was content with a four years' Medical course, but after that year a five years' Medical course was required from all students; and, accordingly, intending students, seeing a five years' course before them, crowded into the Schools in the last year before the alteration. But if the Commissioners will look at the year 1893-1894, they will see a remarkable jump up in the number attending the Catholic University School. The number increased from 158 to 201, and glancing down the column we see that that rise was not a mere accidental or temporary increase, but that it was permanently maintained. That was the first year in which the School was worked under the new governing body; and the sudden increase of numbers, combined with the fact that the increase has been since maintained, shows that a new and stronger spirit was infused into the School by the creation of that body.

There is one other figure of some interest in Table V., and that is the last figure of the column under the heading "Catholic University." After maintaining the number of about 200 quite steadily for seven years, we had a sudden jump up, in 1900, from 203 to 260. And if you look to Table III., you will find there is a corresponding jump up in the number of new students registered. This sudden rise suggests one or two questions of interest. First, is it an accidental temporary rise, or is it likely to be permanent? Secondly, how is it to be explained? I think I can answer the first question, because just before coming over, I got from our own Registrar the number of new students entered for the current year up to the 25th November, and it is sixty-seven, as compared with seventy-two last year. This is distinct evidence that the rise of last year was not a mere temporary one, but promises to be permanent. Again, if you look at Table IV., you will see there was a rise in the number returned for dissections last year from 123 to 156. That also was a proportionately large rise, and I was anxious to know if it was permanent, and I got the number returned for the current year, which is 162, an increase of six upon last year. This also goes to show that rise of last year is likely to be permanent. As regards the second question, it is a matter of speculation what the cause of this considerable rise may be, but it does not affect the subject matter before this Commission.

I have dwelt with some minuteness upon these details, because it seems to me that the record of the growth of our School, from small beginnings, without the aid of public endowments, and the fact that it has now the largest number of students of any Medical School in Ireland, are a proof that it enjoys the confidence of a large section, at least, of the people of the country. I now pass on to show that it deserves that confidence, by reason of its efficiency as a teaching institution. There are two ways in which this efficiency

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may be tested—first, by the qualifications of the teaching staff, and secondly, by the success of the students in open competition with the students of other Schools. As regards the teaching staff, I have prepared a list, which the Secretary has, of the Professors and assistants in the various departments, with a statement of their qualifications as they are usually set out in the programme of the School.* The senior members of the staff are all men of established reputation, whose names speak for themselves. The junior members have nearly all passed through the Royal University, and have obtained high honours in their various examinations. I have accordingly thought it well to append to their names some of the more remarkable University distinctions which they obtained, either at their degree examination or subsequent to it.

With respect to the students of the School, it is well to point out that they are free to present themselves either at the conjoint examinations of the College of Physicians and the College of Surgeons, or for the examinations of the Royal University. In the one case, if successful, they get a licence to practise; in the other, they get a Medical degree. The Conjoint examinations offer the more easy approach to the Medical profession, partly because the examinations of the Royal University are of a higher standard of difficulty, and partly because the Royal University requires a student to pass the Matriculation examination and the First University examination in Arts, before he is allowed to present himself for his first examination in Medicine. Hence the Conjoint examinations are the more popular with students, especially with those who wish to reach their profession in the shortest time, and with the least trouble to themselves. I find that on the average of the last eight or ten years about 40 per cent. of the students of our School go up for the examinations of the Royal University, and 60 per cent. for the Conjoint examinations.

There is no room for competition at the Conjoint examinations, as no prizes are offered, but the Royal University offers each year for competition a small number of Exhibitions and other prizes in connection with their Medical examinations. Taking the returns of the last eight years, I have made out the following table of the Exhibitions gained, in that time, by the students of our School and of the other Schools that enter into the competition. I have also shown the number of students of each School who passed the examinations in the same period.

TABLE VII.

Showing the number of Exhibitions gained by the students of the Catholic University School of Medicine, and the Schools of the three Queen's Colleges, at the Medical examinations of the Royal University, in the years 1893-1900.

—	Catholic Univ.	Belfast.	Cork.	Galway.	Total.
I. Class Exhibitions,	17	13	6	2	38
II. Class Exhibitions,	15	22	13	4	54
Total, ...	32	35	19	6	92
Number of Passes in the same time, ...	422	859	396	144	1,821

This table shows that our students gained one Exhibition for every 13·2 students that passed the examinations; Belfast, one for every 24·5 students; Cork, one for every 21 students; and Galway, one for every 24 students. It is only right, however, to take into account that the students who go up to the examinations of the Royal University from our School, are only about 40 per cent. of the whole, and that they are presumably a better class, taken all round, than those who go up to the Conjoint examination; whereas in the three Queen's Colleges a much larger proportion go up for the examinations of the Royal University. All I want to urge is that our students are well able to hold their own, in fair and open competition, against the students of the endowed Schools. In that connection I may be allowed to observe that we have a much larger number of first-class Exhibitions than any other School. Therefore, putting the best against the best, we stand absolutely first.

The Royal University offers each year to competition a travelling Medical Scholarship of £100, subject to the condition that the successful candidate must go to some foreign School of Medicine, and study there for a period of six months. Since 1893 four such Scholarships have been awarded, and one of these has been gained by a student of our School. A still higher prize is the Medical Studentship, which is worth £200 a year for two years. This Studentship was first established in 1893, and since then five have been awarded, of which our students have won two. Two Studentships in Biology have been altogether awarded since the foundation of the University, and both of these have been gained by students of our School. Lastly, it is the practice of the Senate to award from time to time a Gold Medal in the case of highly distinguished answering at the M.D. examination. Since 1893, six Gold Medals have been thus awarded, and of these students from our School have gained four.

It now remains for me to say a few words on the material resources of the School. I have already mentioned that the new governing body expended all their available funds, about £4,000, in the year 1892, on the improvement of the buildings and equipment. But this was only a temporary makeshift. All that we could do with £4,000 was to add a little to the buildings, to improve the equipment, and generally to put the School into decent working order, whilst waiting for better things. A sum of £4,000 is very small, compared with the requirements of a well-equipped Medical School for 250 or 260 students. Moreover, I should tell the Commissioners that the buildings themselves, originally intended for about 100 students, are totally inadequate, even with the additions we have made to them, to furnish accommodation for the immense numbers now crowded into them. One unfortunate result of this deficiency of accommodation is, that in some cases it doubles the labours of our teaching staff, some of our Professors being obliged to divide their classes into two sections, and give every lecture twice over, first to one section and then to the other, because the Hall is unable to hold the whole class together.

It seems to me that one of the most urgent needs connected with University Education in Ireland, at the present moment, is to provide this School with buildings and equipment, together with an endowment for maintenance worthy of the work it is doing, and such as will enable it to carry out that work more efficiently and under more favourable conditions. I submit that we are entitled to such a provision on the ground of justice; we are entitled to it, also, on the ground of public policy. Our School is the largest Medical School in Ireland; we have an efficient teaching staff; our students gain the highest prizes in open competition with the students of the endowed Schools; they are destined to fill posts of great responsibility in the public service—in the Army, in the Navy, in dispensaries, in workhouse hospitals, in county infirmaries, in lunatic asylums. Surely it is the interest of the State that these men should get their training in well-appointed and spacious halls, and that the teaching staff which is charged with their education should be provided with all the resources that modern science can supply.

If the case which I have laid before the Commissioners on behalf of the Catholic University Medical School be accepted as fair and reasonable, it is easy to point out the remedy, or, in the words of the warrant, the reform, that is desirable in order to render the condition of that School, so far as its scope extends, "adequate to the needs of the Irish people." None of the special difficulties which surround the general University Question have any application to the Medical School. Here we have in existence a governing body, created by an Order of the Lord Lieutenant in Council, under an Act of the Imperial Parliament; and all that is needed is to furnish that body with a capital sum sufficient to provide the necessary buildings and equipment, together with an annual grant for maintenance, and for the payment of the teaching staff, on a scale commensurate with that which is adopted in the Medical Schools already endowed by the State.

I should like to say a few words in conclusion on the question of original research. I think that it is the business of a Medical School, not only to teach what is already known, but also to extend the bounds of human knowledge in the various branches of Medical Science. Great progress is made from day to day, all over the world, in the subjects of Anatomy, Pathology, Bacteriology, Chemistry, Physiological Physics, and I submit it is the duty of every Medical School to take its due share in this progress. Some of the Commissioners will, perhaps, remember how strongly this principle was urged by the late Professor Huxley, during the last twenty years of his life; and it is now, I think, generally accepted, almost as an axiom, by the highest authorities on the subject. I would,

* See page 293.

therefore, suggest that, in the reforms which they may recommend, the Commissioners should not lose sight of original investigation. I feel convinced that there is, in Ireland, a great store of intellectual power, available for the work of research, if only the means and the opportunity were afforded for its development.

What I say with respect to original research in Medical Schools, I would say equally for every other branch of University work. But I put it forward specially with regard to Medical Schools, because we have at the present moment in our own School several men who have every qualification for carrying out original research, and who lack only the means and the opportunity of doing it. Perhaps I may be allowed to give some evidence upon this point. I will take three typical examples. Among the subjects that lend themselves most readily to original investigation, in a Medical School, are certainly included Pathology, Bacteriology, Physiology, and Chemistry. Now, in each of these departments, we are fortunate enough to have, at the present moment, among the junior members of our staff, a Professor specially prepared and equipped for original research. I will sketch very briefly the training which each of them has had.

To begin with the Professor of Pathology and Bacteriology. He read a complete course of Arts and a complete course of Medicine in the Royal University, getting the M.A. degree in Arts in 1887, and the M.D. degree in Medicine in 1891, both by examination. During his course in Arts, he obtained a studentship in Modern Languages, worth £100 a year for five years. Having a bent for research, he took advantage of his studentship to go to the University of Vienna in 1888 to study Pathology; and, in 1889, he went to Berlin, to work at Bacteriology under Professor Koch. On his return he took out his degree of M.D., and was appointed Professor of Pathology and Bacteriology in our School; this being, I understand, the first appointment of a special Professor, in these subjects, made in any Medical School in Ireland. I may say he is now recognised as one of the leading authorities on Bacteriology in Ireland, and his lectures are attended, not only by medical students, but by a considerable number of qualified professional men. He devotes a good deal of his time to original investigation, but he is greatly hampered in his work for want of space.

Next in order comes the Professor of Physiology. He also read a course of Arts and a course of Medicine in the Royal University, getting his B.A. degree in 1886, and his M.B. in 1888. He afterwards took out his M.A. in 1897. He got a studentship in Biology in 1889, which was worth £100 a year for three years, and in 1890 he was appointed assistant to the Professor of Physiology in our School. Wishing to make himself acquainted with the methods of teaching in foreign Universities, and to put himself in touch with the work done there, he went to Louvain for three months in the summer of 1894, and worked at Histology under Gilsen; in 1896, he went for six weeks to Leipzig; in 1897, for six weeks to Marburg (it will be observed always in the summer vacation); in 1899, for two months to Munich, where he worked in the laboratory of Von Kupfer, chiefly at the Histology of the nervous system; in 1900, he went again to Leipzig, this time for three months, and worked at the same subject in the laboratory of Professor His, under the guidance of Professor Held; and, lastly, in the summer of the present year, he went for three months to Madrid, and worked under Professor Ramon y Cajal, who, I understand, is the highest authority in Europe on this particular subject. All this time, he was doing hard work as a teacher in our School, first, as assistant to the Professor of Physiology, afterwards as a lecturer in that subject, from 1893, and, finally, as a full Professor from 1897. It would be difficult, I think, to find anywhere a more striking example than this of a keen desire for original investigation, combined with great devotion to work.

My third example is our Professor of Chemistry. He read a full course of Arts in the Royal University, taking his B.A. in 1895, and his M.A. in 1897, both with first-class honours in Chemistry and Experimental Physics. At the M.A. examination he was awarded a gold medal for highly distinguished answering in these subjects. In 1898 he got a Studentship in the same subjects, which was worth £100 a year for three years. He was also awarded, about the same time, a Scholarship by the Commissioners of the Great Exhibition of 1851. By the aid of these prizes, he was able to spend two years in the laboratory of Professor Fischer, of Berlin, devoting himself largely to original research. He then returned, and got the degree of D.Sc. in the Royal University in 1899, and, subsequently, a Fellowship. About that time a vacancy occurred in the Chair of Chemistry in our School, and he was appointed to fill it. Since his appointment, he has devoted the greater part of his fees to the improvement of the chemical equipment of the School, and to the maintenance of his department.

Now, it seems to me that these men—and I only put them forward as examples; we have others of the same stamp—have given abundant evidence of the qualities that go to make up the successful investigator in Natural Science—capacity, devotion to their work, trained skill, and, pervading all, the magnetic influence of the great masters at whose feet they have sat. But, under the present conditions of our School, original investigation is practically impossible to them. They have no space to work in, and their time is wholly absorbed in teaching. What they need is not much, but it is essential. In the first place, more room; next, assistance in carrying on the teaching work of the School, so as to leave them some leisure for original work; thirdly, improved equipment; and, lastly, a modest competence, to enable them to live.

6634. Sir RICHARD JEBB.—In your very interesting Table, No. V., one sees that between 1892 and the present year the number of medical students attending the lectures of the Catholic University has risen from 158 to 260. During the same period, 1892 to the present year, the number of students at the Cork Medical School has decreased from 200 to 130. Are there any reasons for that progressive decline in the Cork Medical School, which is exactly parallel with the growth of the Medical School of the Catholic University: Are there any special reasons you can assign for that?—I think a small number of students may have come in recent years from Cork to Dublin to complete their medical course, on account of the special advantages offered by the hospitals in Dublin, and, possibly, attracted by the increasing reputation of our School. But I do not think that the loss which Cork has sustained is to be accounted for, in any large measure, by the increase in the number of our students.

6635. You think it is due to independent causes?—Yes. I should like to point out that this table does not give the total number of the students in the four Schools. I wrote out the totals the other evening for myself. The total number of 1886 was 566; in 1892, 642; and, in 1900, it was 645; which shows an increase in the total number of students in these four Schools taken together.

6636. Apart from the attractive influence possibly exercised by the Medical School of the Catholic University, are you aware of any local causes, peculiar to Cork, which would account for the progressive decrease in Cork?—There is a general complaint all round in Ireland, that the number of of medical students has been falling off, and I have been told that this falling off is due to Irish medical students going into Scotch Universities; but our School has not felt that influence at all. There is, I may say, a special reason (which I may, perhaps, be allowed to mention now) why our numbers jumped up so suddenly last year, and maintained the increase in the present year. It is, of course, largely a matter of speculation, but, in my opinion, it is due to the influence of the Local Government Act, which was passed in the year 1898. Previous to that Act, there were a number of most desirable appointments for young medical men, immediately after getting their qualification, from which Catholics were practically shut out; and, owing to the change brought in by that Act, it is expected that Catholics will no longer be debarred from these offices. I should like to give an eaxmple, which will bring this matter home to the Commissioners. In the South Dublin Union there are eighteen dispensaries. Now, a dispensary is a very useful appointment to a young doctor, because it gives him something to live on; it also enables him to practise his profession; and when it is situated in the neighbourhood of a great city like Dublin, it keeps him in touch with the medical work of the city, and affords him an opportunity of getting into lucrative practice. Therefore, the prospect of getting these appointments is a great inducement to students to enter the medical profession. Well, I may say that, before the passing of the Local Government Act, Catholics were hardly ever appointed to these dispensaries. Catholic medical men in Dublin have held very distinguished positions as regards their practice; they

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have been made knights and baronets, Presidents of the College of Physicians, Presidents of the College of Surgeons, and so on; but a Catholic medical man could not get a dispensary in the South Dublin Union. Now, the governing body of that Union is changed, and Catholic medical men will no longer be debarred from these appointments, and, accordingly, they come in larger numbers to our School; that is to say, a larger number choose the medical profession, because they find the prospect of advancement more open than before. The South Dublin Union is, perhaps, an extreme case. Out of eighteen dispensaries in that Union, there were, in the year 1898, only two held by Catholics. There were four medical appointments in the Workhouse itself, of which none were held by Catholics. These positions are now thrown open. I do not say, of course, that Catholics only will be appointed, but they will no longer be debarred. Another class of appointments is the County Infirmaries, which Catholics had only a small chance of getting under the old state of things. These appointments will be more open in future. That, I think, is the real cause of the sudden jump up in the number of students attending our School in the last two years; and, if I am right, it follows that the increase is likely to be permanent, as the cause will be permanent.

6637. Professor BUTCHER.—Is this School of Medicine Catholic, not merely in the sense that there is a Catholic atmosphere, but that there are tests of some kind,—are students necessarily Catholics?—No, there are no tests, and, as a matter of fact, a good number of our students are Protestants.

6638. That is what I wanted to know; then, it is Catholic only in the sense in which you demand a Catholic University?—Yes; it is Catholic in the sense that the administration is Catholic.

6639. Now, if there were a new Catholic University or Catholic College, I suppose you would no longer require a governing body exactly of the same kind as you have here; would it not be merged in a Faculty of the University?—That would be a question for the State. The present governing body is constituted under an Act of Parliament. It cannot be got rid of, I think, without the action of the State.

6640. To put it in another way, if you expect to get State funds, would you not have to conform to the conditions which would be imposed—the general conditions which would be imposed—upon a Catholic College before it could receive State money?—Yes; if we are to get the funds, we must, of course, accept the conditions which will be attached to the granting of the funds.

6641. I mean your demand is for funds?—Yes.

6642. And, therefore, I suppose you contemplate that if you are to get money you would have to remodel your whole constitution in some way, similar to that which might be required for a Catholic College or Catholic University?—Unless it happened that the State was satisfied with the present governing body, which was created by itself.

6643. Only in creating this governing body it has not given you money?—No.

6644. Have you any views as to what should be the constitution of the new governing body?—Nothing further than this:—The Medical School, with its present governing body, might be incorporated in any new College or University that may be created; or it might be governed by the governing body of such College or University. There is one point I should like to emphasise as regards "tests." We have never thought of imposing any tests as regards students, nor is there any formal test as regards Professors. A Professor might be a Protestant; indeed, we have one Protestant Professor at the present time—the Professor of Physics.

6645. Have you any idea how many students are Catholics, and how many Protestants?—I think I was told there are about a dozen Protestant men, and, in addition to men students, we have women students, of whom, I believe, some are Protestants. I may mention that among them is a daughter of the late Provost of Trinity College.

6646. Professor EWING.—In the event of a Catholic College or University being established, do you contemplate the absorption within it of this Catholic School of Medicine?—"Absorption" is a word that may mean various things. I certainly contemplate that the two should work together, but the present governing body of the School would continue, unless dealt with by the State. It would be quite possible for the State to create a new governing body equally acceptable. But, even if the present governing body were not changed, the Medical School, as at present constituted, could be made an affiliated College of the new Catholic University. In my opinion, it would not be easy to create a better governing body than the one we now have.

6647. Is the property of the Medical School vested in the governing body?—Yes. Perhaps I ought to give the Commissioners a copy of the scheme.*

6648. CHAIRMAN.—Yes, I was just going to ask for that; it would be very desirable to see it?—I have three copies here, which I will leave with the Secretary.

6649. Professor EWING.—In pleading for additional endowments——?—Pardon me, I did not say "additional," for, as a matter of fact, we have at present no endowment whatever.

6650. No; in pleading for endowments for this School, did you contemplate an extension of the buildings and equipment on the present site?—No; there is no room for extension on the present site.

6651. It would mean a transfer then of buildings?—It would mean a transfer of buildings. The present site is considered a very convenient site as regards its position, but the space is inadequate for such a building as would be necessary.

6652. You have already intimated to us that you would expect in a new College an efficient equipment in regard to such subjects as Chemistry and Physics: you do not intend to suggest, I suppose, that there should be a duplicate equipment for Physics?—No; Physics certainly could be adequately treated in the Arts College, so as to answer the purposes both of the Arts course and the Medical course. In the case of Chemistry, that could not be done so easily. It would depend very much upon the position of the Medical School with reference to the Arts School. If they were close together one equipment would answer for them both; if they were far apart, that would not be so feasible.

6653. Professor RHŶS.—I do not think you have suggested what the proper endowment of this College ought to be; what amount do you think would be sufficient?—That would require some consideration, and I should also want to know what we should have a chance of getting.

6654. I must say I should like to hear your views without that qualification, and with regard to the other and bigger question, too, I should like to hear your opinion?—I have rather large views about the cost of a properly equipped Medical School.

6655. Well, I should like to hear them?—If we were to build a school from the beginning, I should think from £60,000 to £100,000 would be a moderate estimate for building and equipment. This sum would be small compared to what is expended on Medical Schools in Germany; but of course poor people must take what they can get.

6656. I find people in this country seem to be astounded at the expense of the equipment for the teaching of Science, forgetting that other nations, who are not so well off as we are perhaps, spend very large sums indeed on the equipment of Science?—Yes, that is so.

6657. Would it be any use, do you think, to start without having a fully equipped school?—Oh, indeed it would. It is not a question of starting. We have a flourishing Medical School in existence; and we ask for help to carry it on. If that help is ample, so much the better; if it is not ample, it is still a help.

6658. As to the education of women, I do not know whether you would like to say anything more on that?—I should be glad to answer to any definite question.

6659. With regard to women who aspire to degrees in Ireland, how would you treat them?—I would open all degrees quite freely to them, and I think that the number coming in would not be inconveniently great. As long as you keep them out by iron bars, they imagine they have a great grievance, and that an immense number are being deprived of the advantages of getting degrees. There is one point I should like to mention in this connection. I have taken pains to ascertain whether any practical inconvenience has arisen from having women in our Medical School, and I am informed that there has been none whatever, although the difficulty with us has been specially great, on account of the limitation of our space in relation to the number of our students. That I consider very satisfactory.

6660. How is the clinical work arranged; is that combined?—No; the system in Ireland is different from the system in England. The Medical School does the work of a school, and the clinical work is done in the hospitals. The hospitals have no direct relations

* See page 294.

with the schools, though it is the practice for the students of a particular school to go chiefly to particular hospitals.

6661. And how do the lady students get that part of their education?—I think they go to the hospitals.

6662. Professor LORRAIN SMITH.—I have just two points upon which I wish to ask you questions. I was much interested in your remarks with regard to research: do you contemplate that that would add seriously to the equipment required at a Medical School—would you have to add to the equipment required for teaching a further equipment for research?—I am not very competent to speak on that subject, but I do not think it would add very much to the general cost. Speaking of our own staff, I know they would meet us half way in the matter, and would supply a good deal of the necessary equipment themselves. They are really very anxious to carry out the work if they only had the space and the necessary leisure.

6663. That was just what I wanted—your idea of the space and of what would be required in the matter?—No doubt, the cost of research must be something over and above the cost of teaching, because special apparatus would be required in many cases.

6664. Then as regards the time required for research?—As regards the time, that is a matter of paying an extra number of lecturers and assistant teachers to relieve the Professors from a portion of their more elementary work, and to leave them the leisure and the mental energy which is necessary in order to carry out original research. I contemplate, therefore, the appointment of lecturers and assistant teachers for this purpose.

6665. You therefore urge upon us to consider a substantial addition to the staff and equipment required?—I do, and that not only in the Medical School, but in the Schools of Science.

6666. One other point. So far as I have heard, you have not expressed an opinion upon the general question of external students?—Do you mean as regards Ireland generally?

6667. Yes—the University generally. We have had various views put before us, and I should like to hear your opinion as to that matter?—The Commissioners are aware that, since the establishment of the Royal University, students may come up for examination without being connected with any College; and also that outside students get the degrees of Trinity College without attending lectures. It seems to me that such a system having been once established cannot be easily set aside. I think it would create an outcry on behalf of those who, from want of means, may be prevented from attending Colleges. But I am strongly of opinion, if a settlement of this question were now arrived at, which would give us a large and well-endowed Catholic College, that, so far as Catholics are concerned, the number of students seeking for degrees outside of collegiate institutions would be extremely small. My experience is that both parents and pupils appreciate the great advantages of a Collegiate education, as distinct from grinding.

6668. In regard to that statement, it has been suggested by some of the witnesses that the London University remaining open, if I may use the word, in this respect, is sufficient for the three kingdoms?—As a sort of safety reservoir?

6669. Yes; and that it would meet the wants of lonely students in Ireland, and that the Irish University need not therefore give degrees to these outside students?—It would, I think, create much dissatisfaction if the present system were suddenly put an end to.

6670. I do not mean suddenly; it might take some years to work it out?—I think any scheme which would increase the number of resident Collegiate students would be very desirable; but I should not be in favour of a sudden extinction of the present system.

6671. And would you contemplate, finally, that the London University might be sufficient for Ireland—for the lonely student in Ireland who cannot obtain Collegiate instruction?—The time may come, perhaps, when that will be so, but the change should not be sudden.

6672. I was thinking of three to five years, perhaps—from this—not a very lengthened period?—Perhaps we do not altogether agree about the fundamental question, whether that method of granting degrees is injurious to education. I do not think it is. I think that all the students who can get Collegiate education do get it, and I think the opportunity of getting a degree without Collegiate education is a stimulus to work which otherwise would not exist, and that this stimulus, and this imperfect course of study, is in itself a good thing for them, when they can get no better. But I think that a degree given upon a mere examination, as distinct from a degree given upon a Collegiate course, ought to be distinguished by some clear and defined mark; there ought to be, as it were, two different "brands."

6673. But in the circumstances such as we have to contemplate in Belfast, "cramming" has been so much developed at the expense of Collegiate instruction, practically?—I think that is very unfortunate; but I am not competent to speak about the special circumstances of Belfast.

6674. You would not say that that was not injurious?—I think it is, but I am not very well acquainted with it. I only came to know of it quite lately, and your opinion about it is of much greater value than mine. I should not anticipate any danger of that kind in the case of a Catholic University.

6675. Mr. WILFRID WARD.—A question has been raised in the course of this inquiry as to the possibility of difficulties arising by reason of the question of Professors in their teaching contravening the tenets of Catholic orthodoxy; I believe that in the whole history of the Medical School no difficulty has ever arisen in that respect?—No, never.

6676. I merely wish to have that fact on record.

The Witness withdrew.

The Right Hon. W. E. H. LECKY, M.P., examined.

6677. CHAIRMAN.—Mr. Lecky, we were anxious to have the benefit of your considered views upon the subject of our inquiry; and I think it would be convenient if you were to state them in your own order?—I would wish at the outset to say very distinctly that I speak only for myself and that I have no authority whatever to speak for Trinity College, and I think I ought to add that I cannot speak as an expert on education. It is with great reluctance that I have come to the conclusion that it is the duty of the State to give further encouragement to sectarian and practically exclusive Roman Catholic University Education in Ireland. I do not think there is any country in Europe in which it is more important that young men of different denominations should be educated together, and come to know each other and like each other in the most impressionable period of life, and I do not believe that the Irish Roman Catholics will ever obtain as good an education as they could have obtained under the mixed and undenominational system in Trinity College, or in the Queen's Colleges. They are very unlikely to find teachers representing as high a level of Scholarship and ability as are now to be found in Dublin University, the result of the severe competition of a most difficult Fellowship examination, unrestricted during many years by any denominational considerations, and aiming exclusively at the highest possible educational efficiency. But the education of a University does not depend solely on the teachers. It depends quite as much on the intellectual stimulus, enthusiasm, competition, and ambition generated among the students themselves, and I do not believe that these things will ever be found in a purely sectarian body as they are found in a body where all creeds and classes compete together.

I believe that experience has shown that for many generations Trinity College has shown every disposition to attract Roman Catholic students, and to guard them against the smallest interference with their faith. It opened its degrees to them as far back as 1793, and long before the Universities in England. Its prevailing spirit was shown by the fact that during the struggle for Catholic Emancipation the representatives of the University, at the time when the elections were purely academic, were strenuous supporters of Catholic Emancipation. Plunket, the very leader of the cause, was the member all the time from 1812 to 1826. In 1854 a number of undenominational Scholarships were created, mainly for the purpose of mitigating the just grievance of the Catholics—that they were excluded from the chief prizes in the University. In 1873 every post of dignity, honour, and emolument, from the highest to the lowest,

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was thrown open to them, with the single exception of the Professorships of Divinity. The University was thus placed on a perfectly undenominational basis. The Divinity School makes no real exception, for no one enters into it who is not going to enter the ministry of the Church of Ireland. It interferes in no way whatever with other students. Its Professors, as such, have no voice in the government of the College. It simply corresponds—but on a far more modest scale—with the great Roman Catholic Divinity College of Maynooth, which was set up and endowed by State funds. I believe it will be the universal testimony of Catholic students who have been educated in Trinity College, that neither in the course of their education, nor in the influence of their teachers, nor in the spirit of their fellow students, is there the slightest sign of a desire to interfere with their religion, or in any degree to place them in a worse position for professing it. If, indeed, in student-life the distinction is at all apparent, it is in the somewhat disproportionate number of Roman Catholics who are elected by the students to the presidentship of the College societies. There is a rather special pride in showing in this way the absence of any religious intolerance among the majority.

I think, however, that the Roman Catholics have a real cause to complain, not of anything they are taught in the University, but of the absence of certain things which they are not taught. A provision has long since been made that Presbyterian students should be taught in their own faith by a teacher of their own creed, who has also a general superintendence of their religious conduct. It is well known that the authorities of Trinity College have long desired, if the Roman Catholic Ecclesiastics would accept it, that a similar provision should be made for Roman Catholic students. No difficulty whatever, I believe, would be made in providing that they should be taught by a Professor of their own creed, their theology, their ecclesiastical history, and (if they wish it) their Moral Philosophy. Nor do I believe that there would be real difficulty about a Roman Catholic Chapel, if the funds were provided for building and endowing it. It must be added that residence is not necessary, and if Roman Catholic students wished to live in a monastery while following the lectures or examinations of Trinity College, there is nothing to prevent them from doing so.

During at least half of the Nineteenth Century Roman Catholics gladly availed themselves of Trinity College. If we except the great names of O'Connell, and a few men of genius like Carleton, who rose from the very humblest grade of society, there are scarcely any Irish Roman Catholic laymen of real eminence within that period who had not been educated there. Moore and Shiel—nearly all the Catholic judges and leaders of the Bar, and in Medicine, were educated there. It is a curious fact, that among the graduates was one man—Michael Slattery—who became President of Maynooth and Roman Catholic Archbishop of Cashel. But, within the memory of living men, the whole force of ecclesiastical influence has been employed to deter Roman Catholics from coming to Trinity College. If the Irish Roman Catholics would be content with the best education the country can afford in a mixed University accompanied by the fullest guarantees against any interference with their religion, and with special provisions for teaching it, and for superintending their religious life, they could obtain all this from Trinity College. But it is perfectly evident that they will not, on any large scale, avail themselves of it, and they seldom, I believe, form more than eight per cent. of its students.

The case of the Queen's Colleges is even stronger. They were founded by Sir R. Peel in 1845, and opened in 1849 at a time when the Roman Catholics were excluded from the Fellowships and Scholarships of Trinity College, for the express purpose of meeting the wants of the Roman Catholics, by granting to them an undenominational education on terms of the most perfect equality, and with the fullest guarantees against any possible interference with their religion. An Archbishop was placed on the Senate of the University, and it was intended to give him visitorial powers. An arrangement was at the same time offered for the establishment of denominational residential halls, in which the students might live under strict religious supervision, and for giving them, though not at the expense of the State, separate religious teaching under the direction of a Catholic Bishop, and it was provided in the statutes of the Colleges that regulations might be made for the attendance of every student at such Divine worship as might be approved of by his parents or guardians.

If mixed and undenominational education could succeed at all among the Irish Roman Catholics, it could hardly be tried under more favourable circumstances, and Cork and Galway ought long since to have become great centres of Catholic education. A great body of the Irish laity warmly supported the scheme; and it was indeed largely due to the efforts of Sir Thomas Wyse, one of their ablest representatives in Parliament. But, after some hesitation, the Bishops emphatically condemned it, and, by doing so, gave a blow to Catholic education in Ireland, from which it has never recovered. The new Colleges were pronounced "dangerous to faith and morals." The Bishops unanimously declared, "that the Roman Catholic pupils could not attend the lectures on History, Logic, Metaphysics, Moral Philosophy, Geology, or Anatomy, without exposing their faith and morals to imminent danger, unless a Roman Catholic Professor be appointed to each of those Chairs." At least one Bishop refused the Sacraments of the Church to parents who sent their sons to any of the Queen's Colleges. "The Holy Father," he said, "sees the conspiracy that has been organised to withdraw the education of youth from the influence of the Catholic Church, and in the anguish of his paternal heart, he declares that the result will be moral and intellectual corruption. He invites us all, clergy and laity, to join with him in deploring that Satanic scheme for the ruin of faith in the rising generation." The result of the persistent opposition of the Roman Catholic Bishops has been very evident. Belfast College, which is chiefly frequented by Presbyterians, has been a great success, but I fear no one can say the same of Cork and Galway. In the last reports of those Colleges I find that there were not more than 136 Roman Catholics attending them, while there were only eighteen at Belfast.

It is worthy of notice that while the Irish ecclesiastics have declared an inexorable war against the mixed education of Trinity College, and of the Queen's Colleges, English Catholics are allowed, by the express permission of the Pope, to enter Oxford and Cambridge. It is equally worthy of notice that there is hardly a Catholic country in Europe, or South America, or a Protestant country containing a large Catholic minority, in which the type of State-endowed University Education demanded by the Irish priesthood would be permitted. There are free Universities of this kind, established by voluntary subscriptions, and the degrees of some of them have been in different ways recognised by the State. There are seminaries for the education of the priesthood. There are secular Universities, which include endowed Faculties of Theology, in a greater or less degree, under ecclesiastical control, and, in a few cases, there is separate teaching in Philosophy and History; but all over the world, with scarcely an exception, State-endowed University Education, as a whole, has become secularised and undenominational; ecclesiastical authorities have no control over the government of these Universities, or over their secular education, or over the appointment or dismissal of their Professors, and, in many instances, no returns could be procured of the religion of the students, as it is the first rule of the University to take no cognisance whatever of religious distinctions. The evidence on this subject furnished in the Reports lately presented to Parliament is most instructive and decisive.* It shows that there is hardly a country in the world, Catholic or Protestant, in which the full demands of the Catholic Bishops in Ireland would be conceded, that their ideal of the inseparable connection between secular education and religion, and the necessity of placing the former under ecclesiastical control, though it once widely prevailed, is now almost universally discarded by the State.

For the education of their priests the Irish Catholics have ample provision. At Maynooth they have a College in which they can educate their priesthood exactly as they desire, under the direction of the Roman Catholic Bishops, and without the smallest State influence or control. And this education is carried on in buildings erected by the State, and is paid for by State money. The endowment for many years amounted to £26,000 a year, and when, on the disendowment of the Irish Church, this grant was withdrawn, the College was compensated by a sum, which was, I believe, about £400,000, and it is on the interest of this sum that it is mainly supported. Whatever other educational grievances may exist in Ireland, the Roman Catholic priests, at least, in my opinion, have nothing to complain of.

* Reports from Her Majesty's Representatives abroad on the provision made in foreign countries for the University Education of Roman Catholics—Cd. 37, 1900 Papers relating to University Education of Roman Catholics in certain colonies—Cd. 115.

If Ireland had been a country with a large independent and powerful lay Catholic gentry and upper middle class, I have no doubt that types of University like those which prevail on the Continent would have been readily accepted. The lay spirit, whether it be called free-thinking, or secular, or indifferent, would, in this department, prevail, in my opinion, to the great advantage of the nation. But, in Ireland, through causes which are very obvious, ecclesiastical power in the field of Catholic education, is probably stronger than in any other country in the world. The Catholic gentry are a small, scattered body, almost absolutely without political power. The Parliamentary representation in three provinces is almost wholly in the hands of small farmers or agricultural labourers. On some questions they have decided opinions of their own, and the priests are, to a great extent, obliged to follow them; but, in the matter of education they obey implicitly the directions of their priests, who have in this way a power and an influence hardly paralleled in Europe. It has been increased by the rapid democratisation, both of political representation and of local government. It is felt in the distribution of patronage, through all local bodies, and it is steadily employed against the system of mixed education. It has transformed the system of National Primary Education, which was intended to be a system of combined secular and separate religious instruction, into a system which is mainly separate in secular as well as in religious instruction; and the same influence has been uniformly exerted for the purpose of preventing Roman Catholics from entering Trinity College and the Queen's Colleges. It has not been wholly successful, for a considerable number have been educated there. Even now, the Roman Catholics who are educated at Trinity College and the Queen's Colleges, I believe, outnumber those who are educated in Stephen's Green. But they are deplorably few. Their number does not increase in any proportion to the advance in Catholic wealth and in Catholic Secondary Education; and when all due allowance is made, the number of Roman Catholics in Ireland, who receive higher education, in any place, or form, is far smaller than it ought to be—to the great disadvantage of the State.

I say "when all due allowance is made," for there are great exaggerations of the grievance. One obvious consideration is, that in comparing the University students of the two religions, Divinity students have been usually included on one side, and excluded on the other. A large proportion of Protestant University students enter the University in order to enter the Church. The far more numerous body of the Roman Catholic Divinity students are, by the desire of their Church, educated on the separate system at Maynooth. Then, too, if it is true that the Roman Catholics form about 74 per cent. of the population of Ireland, it is also true that they include the overwhelming majority of small farmers and agricultural labourers, who could not, under any system, avail themselves of University education. The true comparison should be between the Protestants and Roman Catholics in the lay professions, among the landed gentry, and in the upper section of the middle class. It must be added, too, that there exists in Ireland, but especially among the Irish Roman Catholics, an apathy about education in all branches far greater than can be found in other portions of the Empire. It is certainly by no means wholly their own fault, but the fact cannot, I think, be reasonably disputed. For nearly seventy years there has been in Ireland an excellent and costly system of National Education, the Catholic portion being almost wholly under the influence of the priests. Yet at the last general elections very nearly one out of every five voters professed himself an illiterate, unable to read the name upon the ballot paper. Even admitting—what is, I believe, the case—that a large proportion of these declarations of illiteracy are fraudulent, what clearer proof could be given that the pride of knowledge, and the shame of ignorance, which exists in other parts of the Kingdom, and is so conspicuous even among the poorest classes in Scotland, is almost utterly wanting in Ireland? The truth is that Ireland is a very poor country, where few people care about higher education for its own sake, and where most people are obliged as early as possible to earn their own living. It is, therefore, a country in which it is very difficult to keep up a high standard of University Education, and where a multiplication of Universities is almost certain to lower the type. The Intermediate Education system has shown that there has been a great increase in the number of Roman Catholics who have passed through the schools for Secondary Education, but it would be a complete fallacy to assume that, even under the most favourable circumstances, the bulk of these would go to a University. The vast majority pass at an early age into the different branches of commercial or industrial life, or into the Civil Service, and would, under no circumstances, follow a University career. If there had been the strong, spontaneous, general desire for University Education under ecclesiastical influence, which is often alleged, the Catholic College in Stephen's Green would, from its very beginning, have obtained a far different position from what it has done. It could not, it is true, give degrees, but its pupils could obtain degrees as good as any in the Kingdom from the London University, and during many years they could obtain them within its own walls. It had not at that time any endowment from the State, but it had a revenue from private subscriptions in its earlier years, which is stated to have been much the same as the revenue of one of the Queen's Colleges, and it had the transcendent advantage of starting on its career with the most illustrious of living Roman Catholics at its head. Yet, in spite of the prestige of the great name of Newman, it was certainly no brilliant success, and Dr. Newman himself fully recognised that it could not become so without stringent ecclesiastical pressure limiting the freedom of Catholic parents. Writing to Bishop Ullathorne, in 1864, he said: "When I was in Dublin, I did my best in getting a prohibition against Irish Catholics going to the English Universities, for I thought that the new Catholic University in Dublin would have no fair chance of success without such a prohibition; and now, in like manner, your lordship has informed me that, as is natural, if an English Catholic University is founded, Catholic youths will be forbidden to go to Oxford, Cambridge, London, Trinity College, Dublin, Edinburgh," &c.

This will be found in Purcell's Life of Manning, Vol. 2, page 294.

On the whole, considering all these things, I much question whether Catholic University students in Ireland would ever, under the most favourable circumstances, be more than a minority as compared with Protestants; but they certainly ought to be a minority much larger than at present. Nor is it possible to doubt that the attitude of the Irish Ecclesiastics since 1845 has been one great cause of the deficiency. Their influence on the higher education has been essentially deterrent and repressive; and it is, I fear, no exaggeration to say that with few exceptions they have cared much less for education than for influence, and especially for segregating their people from Protestants. That there are in Ireland many Roman Catholic laymen who look with extreme dread and dislike upon a University Education under ecclesiastical influence can hardly be doubted; but in the face of the memorials that have been signed by large bodies of the leading Catholic gentry, including nearly all the Catholic aristocracy and most of the Catholic judges, and in the absence of any important counter demonstration, I cannot resist the evidence that the majority even of this class are dissatisfied with the present state of University Education in Ireland, and on that question follow their Bishops. I think that under these circumstances Government ought to make some serious effort to meet their wishes.

I do not believe that Ireland needs or could bear without injury another great establishment of mixed University Education, and I see no advantage in setting up educational institutions ostensibly unsectarian, but certain to become in their actual working intensely sectarian. Both the Primary Education and the Secondary Education of Irish Roman Catholics are now almost completely under ecclesiastical control, and it is idle to suppose that the Ecclesiastics will ever be satisfied until they have a corresponding influence in higher education. What the Roman Catholic parents who agree with them desire is substantially that their children should be educated exclusively, or at least mainly, with students of their own creed, and that their education in all departments should be under the direction or superintendence of their clergy. In my opinion by far the simplest and best means of gratifying them is through the Catholic College in Stephen's-green. This College was originally set up by private subscription for the express purpose of giving the kind of education they desired. It was modelled after the University of Louvain, which is looked on with special favour by the heads of their Church. It has a staff of Jesuit teachers, who appear to be very efficient, and who probably include most of the best available Roman Catholic teachers in Ireland, and it has more than held its own

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in the examinations for Honours at the Royal University. It was evidently the opinion of Lord Beaconsfield that it was in this direction a solution of the question should be found. In 1868 he offered this College a charter; but the Irish bishops refused to accept it unless it was accompanied by a State grant of money. In 1879 he gave indirectly, through the medium of the Fellowships of the Royal University, a considerable, though in my opinion by no means an adequate endowment. I think that this endowment ought to be direct, and to be largely increased. I should be glad to see the College made a wealthy College in proportion to its numbers, a residentiary College, with prizes that would enable its more intelligent pupils to win by examinations a gratuitous, or almost gratuitous, education—with well-equipped libraries and laboratories, and all the appliances of good education. It is a just Irish grievance that whereas the Maynooth endowment came out of the Consolidated Fund, the compensation which was given when that grant was withdrawn, was taken from the purely Irish Church Fund. If the State made a corresponding grant to the Catholic College, it would at once remedy this grievance, and would probably place the Stephen's-green College on a satisfactory basis. I think the State should say to the Catholics: "If you will not accept our type of education, give your people higher education in your own way, and under the most favourable conditions; only try to put an end to the lamentable deficiency in it which now exists, and which is exercising a most pernicious influence in every department of Irish life."

State endowment naturally involves some State control, but I should hope that it would not be of a kind to interfere at all seriously with the management of the institution. The proportion of laymen and ecclesiastics on the governing or teaching body seems to me, in a College of this kind, to be a matter of little importance; nor should I draw any distinction in endowment or privilege between secular and ecclesiastical studies. If, however, the State provides the salary of a teacher, it should see that his position is not a precarious one, and that he cannot be dismissed without an appeal to an impartial authority; and the State has also an incontestable right to test the efficiency of the education on all secular subjects.

It is on such lines that, in my opinion, the present difficulty about Irish University Education may be most efficaciously met, and with the least disturbance or injury to existing institutions. There is no real question of principle, for the trend of Roman Catholic opinion has long been overwhelmingly in favour of denominationalism in Ireland; and a crowd of institutions, including this very College, which are purely denominational, are directly or indirectly endowed by the State. It does not appear to me that it would be more difficult to carry this increased grant than to establish a new system of professedly unsectarian education under the dominating influence of Roman Catholic ecclesiastics. I think, however, that except in Theology, the students of the Catholic College should go, as at present, to the Royal University for their degrees. The examinations of that University would be the best test of the quality of the College teaching. As a degree-giving body, at least, it is thoroughly efficient. Roman Catholics are largely represented on its Senate. There is no reason whatever to doubt that in the arrangements of its examinations it would duly consider the type of teaching in all of its affiliated Colleges; and its degrees, representing a much larger area of competition, would have a much greater weight than those of a purely sectarian body. The degrees of a University carry with them important civic consequences, and it could not be contended with any plausibility that the amount of mixed education implied in an examination for degrees was perilous to the faith of Roman Catholics. If the Roman Catholic College ever became a great centre of education and enlightenment, the situation might alter, but for the present at least, though I am in favour of a well-endowed Catholic College, I am not in favour of a Catholic University in Ireland.

6678. Most Rev. Dr. HEALY.—Mr. Lecky, I should be very reluctant to put any question that would appear for one moment to imply doubt of your accuracy in all points of history, because I fully recognise your authority and impartiality, and have learned to do so long ago. But there are one or two points to which I will venture to call your attention. First, with reference to what you said as to Trinity College in 1793. I think you said that all the posts in that College, except the Professorship in Divinity, were thrown open to Catholics in 1793?—I said that the degrees were thrown open in 1793.

6679. I thought you said all the posts?—No. That was at a subsequent period.

6680. Did you say the Professorships?—No; I did not say anything about the Professorships—merely the degrees, and it was accepted as a great boon by the Catholics at the time.

6681. Leaving that aside, and coming to what you said about the Queen's Colleges, you seem to think it rather unreasonable on the part of the Catholic authorities in Ireland not to avail themselves of the opportunity offered of the higher education given in the Queen's Colleges. Now, one of the main grounds that were put forward by the Catholic Bishops for objecting to the substitution of the Queen's Colleges, and for declining to avail themselves of them, was the divorce between the teaching of Science and religion, and the ignoring of religion in those Colleges. I am sure you are aware that some of the greatest Conservative authorities in England at the time represented, for instance, by Sir Robert Inglis, the member for Oxford, and many others, denounced the divorce between religion and education as strongly as the Catholic Bishops did?—I am fully aware of it. I did not in the least claim any monopoly of wisdom for Protestants.

6682. You can hardly complain of the Catholic Bishops being unreasonable, seeing that the great body of Conservatives in England took the same view?—I do not think that that quite follows. Conservatives in England have often been exceedingly unreasonable.

6683. I am glad to hear that from so high an authority. Another objection that was raised to the Queen's Colleges at the time by the ecclesiastical authorities was that they had absolutely no means of safeguarding the faith and morals of the students of their flocks who attended those Colleges, especially in relation to the appointment of Professors or the retention of Professors in their offices. Do you think it was an unreasonable thing on the part of the Roman Catholic Bishops, in a country like Ireland, that they should ask to be in a position to safeguard the faith and morals of their students who attended a University College?—I understand that there was such power to safeguard, and that Archbishop Murray was placed upon the Senate of the University and on the Visitorial Board, and that there were strict rules and statutes which provided against any interference whatever with religion.

6684. I was speaking chiefly of the appointments of Professors—that the authority of the Roman Catholic Bishops was, in no way, directly or indirectly, recognised in the appointment of Professors?—Not more than in the continental Universities.

6685. I am speaking of a Catholic country like Ireland, just then, as it were, emerging from the effect of the Penal Laws; and having become emancipated from the persecution of the Penal Laws, they were anxious to keep their flocks secure from the dangers that surrounded them. Was it unnatural that they should expect that in Colleges in the south and west of Ireland, designed chiefly for the education of Catholics, there should be some means of safeguarding the faith and morals of the students in those Colleges?—I should have thought that between residential halls, the Visitorial power of Catholic Bishops, and the special regulations to ensure students going to their own religious service, their faith and morals were sufficiently safeguarded. Of course I cannot judge for the Roman Catholic Bishops; but in my opinion, by the course they adopted, the higher education of Roman Catholics in Ireland was injured to an enormous extent.

6686. You are aware that under the Act of 1878—the Tests Act—by which tests were removed in Oxford and Cambridge, and Durham,——

6687. Viscount RIDLEY.—1871.

6688. Most Rev. Dr. HEALY.—I thought it was 1878; however, it does not matter. By that Act provision was expressly made for the religious instruction of the great body of students attending the Colleges of the Universities, and also not only for their catechetical instruction, but for the celebration of, and participation in religious worship in those Colleges by the great body of students. Is that a fact?—I believe so.

6689. And although it was not done by statute in Trinity College in 1873, as it was done in Oxford and Cambridge, it is provided by the statutes of the College that provision shall be made for the catechetical instruction of pupils of the Protestant Episcopal Church, and also for the attendance at Divine Worship on the part of students of Trinity College. Is not that so?—Yes.

6690. Now, do you think, seeing that the law itself,

both in the case of Trinity College, and at Oxford and Cambridge, directly or indirectly prescribes that means shall be adopted for the catechetical instruction of the great body of pupils and for the maintenance of religious worship in the case of those pupils—that means shall be adopted for the religious instruction of the students in those colleges—do you think it unreasonable that the Roman Catholics, when they are setting up an institution in which they will form the great body of pupils, should ask for the same thing?—Should ask for what?

6691. That provision should be made for the catechetical instruction of the students, and also that a certain amount of religious worship should be provided? My project was that that should be done in the Catholic College in Stephen's-green, where, I suppose, they would have it as a matter of course.

6692. I am talking about a proposed institution in Dublin—because you seem to think that on the whole it would be better for us to send our students to Trinity College?—I think that if you sent them there you could get all that, without the slightest difficulty.

6693. I will come to that presently; but I would rather keep to my present point meanwhile. What I am now asking you is, do you think it an unreasonable thing for the Catholics of Ireland to ask that, in any new institution to be established in Dublin, suitable provision should be made for the catechetical instruction of Catholic students and for the religious worship of the students on the same lines and under the same regulations as have been made in the case of Oxford, Cambridge, and Durham?—That would all be provided for by the proposal I have made. My proposal is that the Catholic College on Stephen's-green, which is entirely under Catholic ecclesiastical control, should be largely endowed for the benefit of those Catholics who disapprove of the other Colleges.

6694. I am thankful to you for that. I intended to say so, before I was done—that I desired to thank you for the statement you made at the end of your excellent address—but I rather wished to suggest the reasons why Catholics were not content to send their students to places like Trinity College or the Queen's University, and why they wished to have an institution in which provision should be made for their students on the same lines as at Oxford and Cambridge?—I have every desire that you should have such an institution on your own lines, if you do not approve of the education which Trinity College and the Queen's Colleges would give. I think the wishes of a particular body should be respected, and I would be prepared to advocate the carrying out of such a scheme. I think you would get a better education under the other system; but the very object of my paper is to meet your wishes.

6695. You think that the institution which the Catholics of Ireland demand would be a denominational institution?—Certainly.

6696. Would you call Trinity College a denominational institution?—No.

6697. You would not?—No; because in Trinity College everything is open to everybody. I think there is a great difference between a College presided over by the Provost and Fellows of Trinity College, who become Fellows by a special educational test, and an institution presided over by a body of Jesuits, who—I do not say it to their disadvantage—are looked upon as people who put the interests of their Church beyond everything else.

6698. There is no proposal before the Commission to place any such new institution under the control of the Jesuits?—No; that is my proposal.

6699. There is no desire on the part of the authorities of the Irish Catholic Church to have any such dominating influence. It has been already admitted that the governing body should be chiefly laymen, and the Professors will certainly be chiefly laymen, and I fail to see, if the same provisions and the same Tests Act are adopted in the case of the new institution, as are adopted in that of Trinity College, why you call Trinity College secular, and the other denominational; I speak now in a legal point of view, and I should like you to point out why you say the new institution would be denominational and the other undenominational?—I can only judge by the Stephen's-green College, which the Catholics set up as representing their desire, and which is a very creditable and excellent institution, but at the same time is an entirely ecclesiastical institution.

6700. Catholics do not propose the University College in Stephen's-green as their ideal. The arrangements there are only temporary arrangements, and they will not be the arrangements for the new institution?—As to that, of course, your lordship is a much better judge than I am. I do not believe that anything will satisfy the Catholic body of Ireland which is not of a denominational and sectarian character. I do not think that Trinity College, as I have said, is denominational at all. The leading people there care mainly for education and have no desire to interfere with the pupils' religion in any way. The persons who have risen to the highest positions there have not done so through their ecclesiastical views, but by passing through severe, purely secular competitive examinations, and its entire spirit is more of an educational than of an ecclesiastical character.

6701. Is not the Provost an ecclesiastic?—Certainly.

6702. And are not a great many of the Professors ecclesiastics?—Yes; because at one time it was necessary for all the Fellows to be in Orders, except five.

6703. There is a Divinity School which must certainly have some influences, direct or indirect, upon the tone of the place?—I do not think it interferes with those not going into it.

6704. It would be very hard to persuade me that as a fact a Divinity School of any Church would not have some very dominating influence in the educational institution in which it existed; and I venture to think it would not be complimentary to the school to say it had not such an influence?—It exercises no doubt a great influence over its own pupils who are going into the Church, but I do not believe that so far as the University as a whole is concerned there is any strong ecclesiastical feeling or spirit.

6705. You said that Trinity College would be prepared to give every facility even for the religious instruction of Catholics in the College, if Catholics were ready to avail themselves of it. Does it, may I ask you, look like that when we see Trinity College has deliberately excluded itself from the purview of this Commission, when there is a question of making an arrangement for the higher education of Roman Catholics in Ireland?—Perhaps I may answer that by reading a resolution which was passed by the Junior Fellows of Trinity College on the 20th of last March. That resolution is as follows:—"That the Junior Fellows wish to urge on the Board the desirability of intimating, publicly and officially, to the heads of the Roman Catholic Church, their readiness to provide facilities for the catechetical and religious instruction of Roman Catholic students by lectures, examinations, and the supervision of their religious observances by clergymen of their own Church, and of inviting their co-operation in drawing up a scheme for securing this."

6706. Am I right in saying that the Junior Fellows have very little to do with the government of Trinity College?—Not much directly, but the Senior Fellows, who constitute the Board, said they were perfectly prepared to accept the principle of this resolution, and to act upon it, except that they considered the first overtures ought to come from the Catholics, and no such overtures have been made. It is a fact that a long time ago overtures were unofficially made by the Board to the Catholic Bishops, in accordance with the desire of the Junior Fellows, but they were not responded to.

6707. They did not intimate, I think, that they would give Catholics a share in the government of Trinity College?—Well, Catholics can become Fellows, just the same as Protestants can, by passing the examination—there is nothing to prevent them, and their influence would increase with their numbers.

6708. How long would it take before they could exercise any real influence in the government of the College?—Unfortunately the ecclesiastics of the Catholic Church have so long prevented their people from entering Trinity College that it is hard to answer your question. Out of 8 per cent. Catholic students, two have been already elected Fellows.

6709. I am not speaking of Junior Fellows who have no power, but if the authorities of Trinity College were really anxious to make provision for the religious instruction of Roman Catholics, they would rather I think have had themselves included in the purview of this Commission?—No; I do not think so. I do not think they could possibly define more clearly what their wishes are than by the resolution I have read, and by the concurrence of the Board in the desire that the things included in it should be done.

6710. It appears to me a strange thing that if they were sincerely animated by a desire to give equality to Catholics in Trinity College, not merely in the matter of Fellowships, but also in connection with the government of the University, that they should (presumably) explicitly have themselves excluded from the purview

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of this Commission?—I think that when the Catholic College and Trinity College do come into rivalry—if that does occur, it will lead to severe educational competition, quite apart from all considerations of politics and religion.

6711. We have had it put before us by—I need not name them—legal and ecclesiastical representatives of the country generally, being the Catholic body generally, that from their point of view what they would regard as a satisfactory solution of this question would be the establishment, within the University of Dublin, of a College for Catholics, in all respects practically equal to Trinity College: May I ask what you think of that proposal?—As I have already said, I have no right to speak for Trinity College; I speak only for myself, and my own solution of the matter I have put as plainly as I can—as there is no reference to Trinity College, I think this is somewhat wide of the subject.

6712. You said a good deal with reference to Trinity College, and I think, if I may venture to say so, that I am hardly wandering from the subject in going back to it?—Well, at the same time, I think I am entitled to reiterate that I have no right to speak as representing the educational views of Trinity College, and you will have probably some witnesses who are more competent than I am to speak on the subject.

6713. But seeing that this view prevails so widely among representatives of Catholic opinion in Ireland, does it not look like a real misfortune that we cannot consider the question at all on these lines?—I certainly had nothing to do with drawing up of Reference to this Commission; nor, I believe, had Trinity College. I can only say that we are doing our work as well as we can. We have done all we can to attract the Catholics, by abolishing all disabilities and throwing all the University posts open to them, and by offering to give facilities for their separate teaching in the doctrines of their religion, and I do not see that we can do much more. The Catholics have not accepted our overtures. We shall be very glad if they accept them. If we had a number of Catholic students there to supply a considerable proportion of the candidates for the Collegiate appointments, we should heartily welcome them. We only wish that our governing body should be a governing body of men who had distinguished themselves in high educational examinations, and that they should be appointed merely on the ground of superior educational attainments, and not on any ground of politics or religion.

6714. I am thankful to you, Mr. Lecky, for what you have said, and also for your admirable remarks made at the end of your opening statement.

6715. Dr. STARKIE.—The Most Rev. Dr. Healy alleged as the chief reason, why the Queen's Colleges were condemned between 1845 and 1850, the fact that there was a divorce between the teaching of Science and religion in those Colleges: I am anxious to know do you agree with that?—No, I should not say so.

6716. Is it not a fact that the only ground that there was for saying that there was a divorce between the teaching of Science and religion was that the Government refused an endowment for Theology?—I should say that the statutes laid down in the clearest possible way that there should be no interference with religion, and that Science should be taught by scientific men.

6717. But religion was not endowed?—Religion was not endowed.

6718. And, as far as I can understand from the debates of the time, that was the chief reason of the Catholic Bishops for condemning the Colleges?—Catholics were very much divided on the subject. O'Connell, of course, supported the Bishops, but that was very much a political thing. Sheil opposed the Colleges on the ground that he wished the Fellowships of Trinity College to be thrown open to Catholics.

6719. My point is that religion was not endowed, and that, for that reason, Sir Robert Inglis called the system a Godless system?—Yes.

6720. Is it not a fact that, in 1873, and more recently under the scheme proposed by Mr. Arthur Balfour, religion was also left unendowed, and that the Bishops in Ireland were satisfied with that proposal?—I cannot answer for the Bishops, but I believe it is true.

6721. To come to Sir Robert Inglis's statement in Parliament, which was caught up by opponents of the Queen's Colleges, that the Government had set up a gigantic scheme of Godless education, do you know what Sir Robert Inglis's reason was for calling it a Godless system?—I know that anything that was proposed by the Liberals at that time, and especially any proposal for mixed education, was at that time attacked by a considerable section of the Conservative party.

6722. I think that Sir Robert Inglis gave as his chief reason for applying that term to it, was that the Catechism of the Church of England was not made obligatory for all students?—I am not sure. I never read his speech, but that is quite possible.

6723. But that is the fact, for I have read his speech.

6724. The second reason assigned for the condemnation of the Queen's Colleges was that no safeguards were provided for students of the Catholic faith.—It is true that in the first draft of the Bill no safeguards were provided, but the Bill was amended in Committee, and very considerable safeguards were provided in the way of Catholic Deans of Residence, who had authority to visit the lodging-houses of students for the purpose of inquiring whether the students attended their places of religious service?—Yes.

6725. That, at any rate, was one safeguard, and, I believe, it is true to say that it satisfied the wishes of a number of the Catholic Bishops in Ireland. I think that that is made clear by a letter of Dr. Murray's, in which he says:—"The Sacred Congregation, always prudent, always dignified, gives no countenance in these documents to the absurdity of applying the epithet of 'Godless' to institutions which comprise the ministers of religion, and appointed for the express purpose of teaching the students to adore and love and serve God?"—I have not gone very minutely into the history of the question, but there is the letter of O'Connell to Archbishop MacHale, in which he said it was unwise for Catholics to seek to have residential Colleges, because they were a poorer body than the Protestants, and that the Protestants would find it much more easy to spare the means to avail themselves of such Colleges.

6726. With reference to the way in which the Professors had been appointed, Mr. Sheil, in his speech before Parliament, proposed that a Board, on which Catholics should be largely represented, should be appointed by the Government to nominate the Professors, and the Government did actually nominate such a Board, on which Archbishop Murray was appointed to serve?—I think he refused to serve.

6727. Archbishop Murray refused to serve, but that Board was nominated by the Government?—Yes.

6728. And they also proposed that the appointment of Professors should, after 1848, be vested in the Senate of the University?—I have not a very intimate knowledge of the early history of the Queen's Colleges. You are much more competent to speak on that subject than I am.

6729. Mr. WILFRID WARD.—I think you recognised that some of the Irish Bishops were in favour of trying to work the Queen's Colleges?—I believe Dr. Crolly and Dr. Murray were.

6730. Is it not true that Dr. Murray attempted to get Rome to sanction his views and accept the Colleges, up to the year 1851?—That I cannot answer.

6731. Mr. Greville states in his Memoirs that the final reason which prevented the acceptance of the Queen's Colleges by the Catholics was Lord Russell's Durham letter, which made the Catholics feel that they could not trust the Government—that it was regarded at Rome as so insulting and such a proof of the hostility of the British Government to the Roman Catholic religion that the negociations came to an abrupt termination, and the Rescript of 23rd May, 1851, gave a fatal blow to the Colleges. Do you think that is true?—I think that is very probable. I have no doubt of the great influence of O'Connell and Archbishop MacHale. O'Connell was, at that time, I need scarcely say, in violent opposition to Peel, and Archbishop MacHale was entirely against the Colleges.

6732. That was before 1851?—Yes. They took a very prominent part in the movement against the Colleges before 1851. There is a curious letter of O'Connell's on the subject.

6733. I merely wished to bring out the fact that Mr. Greville, in his Memoirs, states that, though O'Connell and Archbishop MacHale had great influence in Rome, and exerted it throughout against the Queen's Colleges, the final Rescript of 23rd May, 1851, by which the more liberal party of Catholics were finally defeated was due, in a great measure, to the Durham letter and the Ecclesiastical Titles Bill. I wanted to know whether you have any views with regard to that statement?—No; I have not gone so closely into it as to be able to give any opinion.

The Witness withdrew.

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Robert Samuel Heath, Esq., M.A., D.SC.

ROBERT SAMUEL HEATH, Esq., M.A. (Cantab.), D.SC. (London); Vice-Principal of the University of Birmingham, examined.

6734. Professor EWING.—Professor Heath, I think you have been Principal of Mason College, Birmingham, for many years, and are now Vice-Principal of the University of Birmingham?—Yes.

6735. Perhaps it would be convenient if you would give the Commission in your own way a short statement of the constitution of the University of Birmingham, and the steps which have led to its creation?—The foundation of the University rests on a previous institution, known as Mason College in Birmingham. This College was founded by Josiah Mason in, I think, 1875, and it was opened for the attendance of students in October, 1880. But it was a small proprietary institution, the governing body of which was in the main co-optive. Five members, it is true, were elected by the City Council, but the other six members of the Governing Body, known as the Trustees, were co-optive. There was no public representation whatever beyond the five members of the City Council, and, as a matter of fact, those five members of the City Council took very little part in the management of affairs. Consequently, the College came to be regarded almost as a proprietary institution. Before any movement could be inaugurated for the establishment of a University, it was necessary, in the first place, to widen the basis of the government of the College, and for that purpose an Act of Parliament, under the name of the Mason College Act, was promoted in 1897, and became law. The chief provision of that Act is to incorporate the College as a national institution, and to enlarge the Governing Body, making it truly representative. For this purpose, in the first place, there were a large number of prominent citizens in and about Birmingham, who are mentioned by name, as Life Governors, and, besides those, the City Council and all the County Councils of the five neighbouring counties and county boroughs sent representatives; the governing body also included ten members of Parliament, a large number of important office-holders in Birmingham, the Bishops of the neighbouring dioceses, and other public men in the immediate neighbourhood. Another effect of this new Act was to abolish certain restrictions in the matter of religious belief which existed originally in the College. It was curious that, while the Professors and the students were under no disabilities whatever on account of their religious belief, yet there was a qualifying clause with reference to the Trustees of the foundation. The Trustees of the foundation were required to be laymen and Protestants. No minister of religion of any kind might be on the Governing Body, and no Roman Catholic. The matter came to a crisis when one of our prominent University officials who ought to be on the Council, with a view to the proper government of the College, was a Roman Catholic, and, of course, it was impossible to get over this test clause, which was declared to be fundamental in the original trust deed, without an Act of Parliament. For this reason we went for an Act of Parliament instead of a charter, in order to override this fundamental clause. Almost immediately—I think at the first meeting of the Court of Governors of the newly-constituted Mason College—the movement began in favour of extending the scope of the work, and getting University powers. The preparations occupied about two or three years. Public town's meetings were held; various committees were appointed. There was one committee for the purpose of canvassing for subscriptions and getting an endowment for the University; another committee, of which I was a member, and in regard to which I took a somewhat active part, was concerned in the drafting of the charter and the provisions for the constitution of the new University, and so on. The charter was finally obtained in March, 1899. The government of the University is almost a copy of the re-constituted government of the College previously inaugurated by the Act of Parliament. The University body consists of the Court, including all the Governors of whatever character; then there is the Council, which is a kind of Executive Committee of the Court; then we have the professorial element on the Senate, the faculties of the University, and also certain informal committees, which are known as Advisory Boards, on which sit, not merely academic persons, but persons engaged in active operations in the City. The Court is supposed to be the supreme Governing Body, and all the statutes and ordinances of the University, which govern its procedure, have to pass before the Court, and be approved by it before becoming operative. On the other hand, the Council have a very free hand in the active management of affairs; the whole property of the University is in their charge, and they are technically, at any rate, charged with supervising the educational proceedings which are undertaken by the Senate. As a matter of fact, there is a fairly sharp dividing line between academic questions and financial and administrative questions. The academic questions, such as those relating to examinations, and so on, are practically left in the hands of the Senate, whereas the Senate takes very little part in the management of the business or financial transactions of the University. We have, in this way, the advantage of the lay experience of very keen, shrewd business men, on the one hand, for the purposes of administration; and we have, on the other hand, the almost unfettered action of the professoriat in matters purely educational. The faculties of the University consist of small sections of the professoriate, who are charged with subjects closely allied. For instance, we have a Faculty of Arts or Letters, which does not include Mathematics; then we have a Faculty of Science, which includes Mathematics; a Faculty of Medicine; and in the charter there is also mentioned a Faculty of Commerce. The Faculty of Commerce, however, is not yet constituted. At present, there is only one Professor in that faculty; he was appointed about three months ago, and his first year of office is to be occupied in laying down plans for the future conduct of the faculty and the number of Professors and other lecturers that will be required to carry it on. I do not know whether what I am saying is of any interest to the Commission. I have no views to put before the Commission, and no statement to make, but I shall be glad to give any information I can.

6736. I think the Commission would be glad to have a little further information with regard to the scope of the intended University, the amount of the funds which it is intended to spend, and the general lines on which the expenditure is to be carried out. I may say, Professor Heath, that the Commission have already had the advantage of having circulated among them copies of a report of an Advisory Committee, appointed in connection with the promotion of the University of Birmingham.* To a certain extent that report gives these particulars, but, perhaps, you might summarise them for us?—The original endowment of Josiah Mason was about £200,000. After deducting what was occupied in purchasing the site and building the College, it produced a revenue of about £4,000 per annum, but as a good deal of it consists of ground rents with short periods of reversion, in the course of ten or twenty years it will be considerably more valuable than it is at the present time. Then the appeal for funds in aid of the establishment of the University produced, roughly speaking, £400,000, which included two specific gifts of £50,000 each, tied up for special purposes, viz., Mr. Carnegie's £50,000 for the purpose of building and equipping Engineering laboratories, and an anonymous contributor's £50,000 for the purpose of developing a Faculty of Commerce. For the rest, the gifts were perfectly open. Since that time, the City Council of Birmingham has voted in aid of the University the proceeds of a ½d. rate, which will be upwards of £5,500 per annum. We also have received promises of small subscriptions from the County Councils of some of the neighbouring counties. For instance, Staffordshire has promised, for the present, at any rate, a subsidy of £250 per annum in aid of the department of Mining and Metallurgy, in which that county is particularly interested. As to how the money is to be spent, I am not sure that I can give the Commission very much information. A good deal of capital expenditure has already been incurred in strengthening departments which already exist. Then, the University has appointed, in accordance with the Charter, a Principal—a Crown appointment—and he

* See page 318.

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has a research laboratory, and altogether the Principal and his staff cost nearly £3,000 per annum. Besides that, we had a gift of a site of twenty-five acres from Lord Calthorpe, and before building operations can in any way be commenced, a great deal of work has to be done in laying out new roads, levelling, and other preliminaries. We have a building scheme, which will probably absorb at least £200,000, which will be carried out as soon as plans can be prepared, and the buildings put up. I think I may say that almost every pound which the new endowment produces is already forestalled, and if we carry on the institution on the lines on which we are at present sketching it, we shall soon have a considerable deficit, which, I believe, the promoters of the University hope to meet by further subscriptions later on when the need arises.

6737. In this report there is a schedule of proposed expenditure, which speaks of £80,000 being spent on land and buildings. Is that only for some special departments?—The building plans have grown very considerably since that report was drawn up. We have plans ultimately to build to the extent of £200,000 capital, and I believe that they will be proceeded with if it is possible to do so. But, at an early date, considerably more than is mentioned in that report will undoubtedly be spent.

6738. So far as the details of this report show, it appears as if the expenditure mentioned there is for new buildings for the teaching of Engineering and Metallurgy, and allied subjects; is that so?—The new buildings are devoted almost entirely to Engineering, Metallurgy and Mining.

6739. And it is now contemplated to spend on buildings and equipment for these subjects a sum of how much?—Ultimately, I think, nearly £200,000.

6740. On buildings and equipment for Engineering?—For those three technical subjects.

6741. Namely?—Engineering of all kinds—Electrical, Mechanical, and Civil—Metallurgy, and Mining.

6742. Can you give us any information about the expenditure on the Medical School buildings and equipment?—When the Medical School was incorporated with Mason College, it was necessary to provide a home for it, and that cost us about £18,000. It is fair to say that this sum provided, in addition to the purely medical buildings, a new wing to the library, and a large theatre, which we use for general purposes, but the rest of the money was spent on purely medical buildings. Old buildings, existing and belonging to the College, behind the former buildings, were adapted for this purpose.

6743. In addition to the provision for the teaching of Applied Science, which will be furnished in Birmingham by this new University, is there a Municipal Technical School?—Yes. The Municipal Technical School was commenced about 1890, shortly after the passing of the Technical Instruction Act, and it was subsidised by the Excise Grant, which goes to the Corporation of Birmingham. I think that money is divided equally between the Municipal Technical School and the School of Art. The Committee, which was appointed by the City Council to consider this question of the Municipal Technical School, was a very strong one. It contained just a bare majority of Council members, but almost all the rest were prominent people connected with Birmingham educational establishments in the city, and they reported in favour of establishing and building a new school. That was done, and the School has been at work now for a good many years. At first one could not help being afraid that it might rather clash in its working with the existing Mason College, but great pains were taken by all parties—as is usual in Birmingham—that definite spheres of operation should be assigned to the different institutions, and there has never been the slightest clashing or possibility of clashing. The work of the Municipal Technical School is divided into two parts—the evening work and the day work. The evening work is confined almost entirely to artisans who are occupied during the day. It is an exceedingly good, well-managed, and well-equipped institution of its kind. That part of the work does not interfere with the University work at all; the University work is entirely confined to those students who can give their whole time to study. The day work of the Municipal Technical School is really of the character of a Technical Secondary School for boys, and the boys leave at the age of seventeen years. So there, again, the day work of the Municipal Technical School has not interfered in any way with the work of the University. The University has representatives on the Governing Body of the Technical School. In fact, I was Chairman of the Technical Education Committee of the School, which had the management of all the educational arrangements when the School was instituted, for nine or ten years.

6744. What faculties have you established in the University?—The Faculty of Arts includes the Professors of the following subjects—Latin, Greek, English, French, German, Philosophy. The Faculty of Science includes Mathematics, Physics, Chemistry, Botany, Zoology, Geology, Physiology, Engineering.

6745. Is Brewing included?—It is in the Faculty of Science.

6746. And Metallurgy also?—And Metallurgy also. It is possible that at some time we shall have to institute a Faculty of technical applications of Science, but at present such a proposition is not regarded with any favour in the University.

6747. Then, at present, you include the applications in the Faculty of Science?—In the Faculty of Science.

6748. And, besides that, you have a Faculty of Medicine?—Yes, a Faculty of Medicine, and, as I said, we shall shortly be constituting a Faculty of Commerce. The organising Professor is appointed, and as soon as his proposals are ready, and have been presented to the Council, I have no doubt efforts will be made to carry them into effect.

6749. In the proposed scheme is much importance attached to the provision necessary for the carrying out of research in the University?—Yes; I think I may say that that has been put in the very forefront of our plans from the very first. When the first Mason College Act was instituted, care was taken to define precisely the objects for which the College was founded, and the idea that it had in view, and a special clause was put in declaring to be part of the work of the College to make provision and give facilities for the prosecution of literary, scientific, and medical research—that is to say, the prosecution of research in all the faculties of the College, and these provisions are repeated in our University Charter.

6750. Can you refer us to any document in which we shall find particulars of the constitution of the Governing Body—some document which might be incorporated in your evidence without going through it?—The Charter, of course, is the most complete document of that kind. A complete account of all our arrangements is in the Calendar.*

6751. I notice that in the abstract of your evidence, which you have put before us, you speak of technical and non-University courses; what are these?—Our students are of two kinds: first, those who are really undergraduates of the University, who have matriculated, and are members of the University; and, secondly, quite a large body, probably the majority of the students of the University, who never have matriculated, and who are not, in any sense, candidates for degrees. These attend courses of instruction for other purposes, some to pass examinations other than our own, and some of them with a view to professional qualifications. These are strictly non-University students, and that is what I had in my mind when I put that down. All our courses in the University are primarily designed to meet the needs of University students, but if, at the same time, they meet the needs, as they do, of a large class of other students, who are not matriculated students, we admit them freely. So that the University discharges the proper functions of a University and the proper functions of a College simultaneously. A good many of the technical courses are non-University courses. The Brewing course, for instance, is a non-University course; there is no degree in Brewing. There will be degrees after this year in Engineering subjects, but last year they were technical non-University courses; this year they will be organised and brought into line with the other courses in the Faculty of Science. The two courses exist side by side.

6752. Have you any department of Agriculture?—No.

6753. In your opinion, Professor Heath, is there a distinct advantage in associating technical subjects with the general work of a University?—Yes, I think so,

* University of Birmingham—Calendar for the Session 1901-2, page 25.

distinctly. It is impossible, in nearly all cases, to say where technical subjects begin and Pure Science ends; and for the so-called technical courses of a University a considerable preliminary training in Pure Science is compulsory on all students. I think it would be a great pity to dissociate the application of Science from its pure aspect. The two, with us, are worked together in the same faculty, and those Professors who have charge of the technical subjects sit side by side with the Professors of Pure Science in laying down the regulations for the examinations for degrees, and also the courses of study for students who are candidates for honours.

6754. Professor BUTCHER.—There is one question I should like to ask you, Professor Heath, because, I think, it is a matter in which Birmingham University has taken a new departure in this country, and that is as to allowing class work to count for something towards the degree examination. Would you mind telling us how far you recognise the class work for that purpose?—Yes. The class work is counted at both ends of the scale, as it were. Any candidate for a degree has to show that he has attended certain specified courses of instruction, and that implies, not merely that he has attended regularly, but has passed a certain minimum in the class examination. If he does not reach that minimum he cannot become a candidate at all; he is put back before the degree examination takes place. That is at one end of the scale. But, supposing he gets more than the minimum, he is allowed to enter for the examination. Then his final place depends again on two factors—the work he does in the examination, the answers he sends up, and also, again, his class marks, which are added in on an equal basis with the others. But that is not all; this normal minimum is not the absolute minimum. There is a small margin where we allow super-excellence in one side of the work to counterbalance a deficiency in the other side.

6755. The reason I ask in detail about this is, that I think it is the most important step which has been taken in any University—in this country, at least, as contrasted with America, where it has already existed—to give proper weight to class work, and to prevent mere examination work having undue weight in the general result; and we would be very much interested in learning how, in practice, this experiment works out. You have, as yet, not had much opportunity of testing it?—We have had one complete set of examinations of all grades. These examinations took place in June last, and I may say that the external examiners—who had no voice in determining the system—fell in with it with great alacrity, and with much interest, and they expressed themselves very favourably towards the success of the scheme. As regards its effect on the students, I have no hesitation whatever in describing it as a perfect success. The carefulness of the students in attending to lectures, the class examination, and home work—all of which count in this class work—was very marked indeed.

6756. That is just what I wanted to know?—That is what we hoped would be the result of it.

6757. Some difficulties have sometimes been started in regard to the adoption of this plan with reference to the relations between the external Examiner and the internal Examiner, because, of course, the internal Examiner, the Professor himself, is the only person who can speak with adequate knowledge as regards the class work. But I gather from what you say that, so far, you do not find that the external Examiners' verdict comes into collision with the decision arrived at by the internal Examiners?—No. Of course, in certain kinds of internal work the external Examiner can form an opinion. For instance, in all laboratory work, we insist on the students keeping a diary, which describes the experiments undertaken, and the instruments used, and the results; and this is sent to the Professor or lecturer in charge of the laboratory. These laboratory note-books are open to the inspection of the external Examiner, and, as a matter of fact, they were sent in certain cases to the external Examiner before the examination.

6758. And I suppose that in any other class of examination, in which the only record is that of paper work, those papers can be preserved, and, in case of doubt, submitted to the external Examiner. I do not know whether you have any provision of that kind for preserving the records, but it might be made?—We have not done so. The view I take of the situation is this: If an external Examiner were determined to veto a certain candidate, he would have his way; we should have to give way, and abide by his decision. We should regard him as the arbiter in case of a dispute. By the Charter we are compelled to have external Examiners associated with us, and, clearly, unless we can carry out the system with the consent of the external Examiners, we cannot carry it out at all. If they objected to having part of their prerogative taken away from them we should have to give way.

6759. I see that?—But no such difficulty did arise on the occasion on which external Examiners took part in the examination.

6760. I am told by those who are more cognisant of the plan, and who have worked it themselves, or seen it worked in America, that there the result has certainly been to check the domination of a mere examining system, and to stimulate the actual work carried on by the student during his term. Is that what you have heard? Have you gone into the American experience at all?—I have heard similar reports of the working of the system there. But our idea in inaugurating this system is to have the student continually under examination, and not to concentrate the examination on the work at the end of the session.

6761. I am told that this danger has arisen in America, and that it is one of the things to guard against in such a system, viz., that the examination may be taken in so piecemeal a way that the student only passes from one small branch of his subject to another, dismisses it, and gets credit for each successive examination without ever having mastered, or kept in memory, the subject as a whole. I suppose your examinations are not so frequent as to allow that sort of piecemeal work to occur?—The examinations take place once a year on a specified schedule of subjects, just as the Intermediate examinations, for instance, of the University of London are carried on.

6762. Therefore, you cannot have the danger which has arisen in America from petty examinations held every few months?—No.

6763. Does the system apply to honours, as well as to the pass degree?—We have no honours at present.

6764. I ask the question with double reference now, partly because the University of Edinburgh is seriously considering this subject; and, with reference to Ireland, I think it may be of great importance, as the domination of the Royal University examination system is one of the things we have to guard against; we should, if possible, stimulate the class work of the College as distinct from the mere examining. Might I just ask this one further question, whether there are different arrangements applicable to different classes—for instance, to the Arts and Science classes—in respect of this term-making, and the extent to which class work counts?—No. An attempt has been made by the Senate, which consists, of course, of all the Professors, to organise a system applicable to all faculties. On the medical side, however, there is a slight difference; there no compensation is allowed; every student has to pass in both sections independently, and get a certain minimum, and nothing below that minimum can be compensated for. This was felt to be necessary on account of the regulations of the General Medical Council.

6765. Professor LORRAIN SMITH.—I should like to ask for a little more detail with regard to the last statement in your Summary of Evidence—the organisation to prevent over-lapping. With regard to the Technical School, you said that special care was exercised to prevent clashing?—Yes.

6766. Is there any definite arrangement which resulted from attention being called to that point—I think you mentioned that you were Chairman of the Committee of the Technical School?—I do not think that there is any formal arrangement to prevent overlapping, but it is effectually managed in this way: Nearly all the governing bodies of the educational institutions in Birmingham themselves overlap. For instance, we have probably half-a-dozen members on our Council who are also Governors of the Grammar School; some are members of the School Board, and some, again, members of the Committee of the Technical School. I myself am a Governor of the Grammar School, and a member of the Technical School Committee, and have been Chairman of the Education Sub-Committee. Almost every member of any one of these Boards has an opportunity of learning what the other institutions are doing, and there

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is a general disposition to keep them from overlapping. But there was, on one occasion, when the Technical Day School was started, a special Committee, summoned by the City Council under its own auspices, to lay down a sphere of work for the School, so that it should not clash, on the one hand, with King Edward's Foundation, and, on the other hand, with the then Mason College. That is, I think, the only occasion on which a formal body was called into existence to adjudicate on a question of this kind. Supposing there were any clashing, I am perfectly certain that public opinion in Birmingham would demand the appointment of a Committee to inquire into it.

6767. With power to adjudicate?—Yes; or, at any rate, with powers of suggesting.

6768. As regards evening classes, I should like to hear your opinion. It has been put before us by one witness, at least, that a University which attempts the teaching especially of modern subjects, must be prepared to give classes of the highest type in the evening as well as in the day in any subject, and practically at any hour in the evening, for those who wish to attend the classes?—We do not do that in Birmingham; the University has no evening classes at all. We have constantly been petitioned to put on evening classes, to enable schoolmasters, for instance, and those who are engaged in the daytime, to prepare for a degree. But we have felt that, in order to give adequate instruction for degrees at all comparable with the instruction given in the day classes, the classes would have to be extended over a long period of years, and the length of time would be prohibitive. For instance, it is possible that, by taking one subject at a time, and giving two or three evenings a week to it, a person could reach a proper standard of education in that subject in a year. But, then, he would have to give another year to cover another branch, and another year beyond that; he would probably take three years at least to cover adequately the work which a day student could do in one year. That being so, we have felt that the arrangement could not succeed.

6769. I quite recognise the difficulties; I was just wishing to hear your experience in regard to them. Might I suggest another difficulty: Would it mean duplicating the staff?—Yes, but that is a smaller difficulty, I think. If there were a real demand, the University would, I think, provide new teachers. But that is not our difficulty. Our difficulty is the difficulty of standard.

6770. To keep the standard sufficiently high?—To keep the standard sufficiently high.

6771. You said that the boys, when they left the Municipal Technical School, were seventeen years of age. How long do they attend the School?—They come at eleven, or twelve, or thirteen years of age, according to their proficiency. There is an entrance examination, which includes very elementary subjects. The School authorities are anxious to get them as early as possible, always provided they reach a certain minimum standard.

6772. They attend until they are seventeen years of age, do they?—Until they are seventeen.

6773. The plan is that they should then pass to the University?—Or into business. If they continue their education beyond that age, then the intention is that they should come on to us.

6774. Can you give any general information as to the attainments that the boys are supposed to have in passing into the technical department of the University?—The entrance to the technical department is exactly the same as to any other department. All must pass through the door of the matriculation examination, or some examination which the University accepts in lieu of the matriculation examination. The only slight difference that we make for technical students is that we do not insist upon Latin.

6775. How far is it technical? Are these boys who study in the Technical School up to seventeen years of age studying Science or Applied Science?—To a certain extent, undoubtedly, they are, but they have to begin afresh really when they start with us.

6776. At Applied Science?—Yes.

6777. Do you assume that they have practically all that they need in the way of Pure Science?—Oh, no. They have to begin afresh, just as if they had not come from the Technical School—just as if they came from an ordinary school.

6778. Without Science teaching?—Without much Science teaching. We make no allowance to them.

6779. Between the years of fourteen and seventeen they have been studying Science; you say that you make no allowance for that?—They have to go through the same avenues as any other students. We should allow them to attend an advanced course in Chemistry or Physics in lieu of a more elementary one, but they must pass the same examination, and be signed up for the same number of attendances; only, of course, if they were fit for a high class, we should allow them to take a high class.

6780. How long has the Professor in the Commercial Faculty been appointed?—He was appointed in August.

6781. I suppose we need not look for an immediate report from him?—I believe his plans for the organisation of his faculty will be laid before the Senate in the early spring of this year, and will be included in our programme of studies for next session.

6782. Which will be published when?—In June.

6783. Of course, it would be of great interest to us to have the advantage of reading the result of his work?—Certainly.

6784. Viscount RIDLEY.—I wish to put one question in order to clear my mind. I did not quite understand whether you had any resident undergraduates. You have no College where students reside separate from their own homes?—No; it is purely a day University. A great many students come in by train in the morning from the neighbouring towns; those from more distant parts of England live in lodgings. We have no hall of residence. That is one of our crying needs. But we are able to exercise some little supervision over lodgings.

6785. Somewhat similar to what is done at Oxford?—Not so elaborate.

6786. Dr. STARKIE.—Are the lodgings licensed?—No, they are not exactly licensed, but we keep a register of lodgings that we know about and can recommend.

6787. Do you ever strike them off if they are unsatisfactory?—I do not remember a case ever having occurred; I do not know that any have proved unsatisfactory. But we submit this list of lodgings to intending students. If they choose one of them, well and good; if they prefer to make their own arrangements we do not say nay; we do not impose our lodgings upon them.

6788. Viscount RIDLEY.—Do you require so many weeks of attendance on lectures, or so many years, as necessary for the degree examination?—Yes; all students have to attend organised courses for three years before they can attain a degree.

6789. Professor EWING.—I suppose there is no objection to our having this paper of the Advisory Committee's printed*?—I think not.

The Witness withdrew.

Professor W. Macneile Dixon, LITT.D.

W. MACNEILE DIXON, Esq., LITT.D., Professor of English Language and Literature, in the University of Birmingham, examined.

6790. CHAIRMAN.—Professor Dixon, we are very much indebted to you for having given us in the memorandum that you have sent in such a clear statement of your views on the more general questions that are referred to us, and we find it is so expressed in propositions and divisions that we do not propose troubling you by going over it again. We shall take care that it is printed and appears as a valuable contribution on the subject,† and should you desire to edit it or go over it, with a view to its publication, we shall be obliged if you will do so. But we shall not trouble you upon what, for shortness, I will call the Irish question at all, and we are much obliged to you for having given us such a suggestive paper?—Thank you, my lord.

6791. Perhaps you will favour us with anything you have to inform us about as to the constitution of the University of Birmingham?—Well, my ideas on the

See page 318.

† See page 291.

constitution of the proposed Catholic University and of the Queen's University in the North are rather modelled on the constitution of Birmingham University. It seems to me that this constitution, which is a very recent one, and which was drawn up after long and careful consideration of all existing University constitutions, would be a good model. It involves some of the most important points, such as that of association with the community, and the division of the labours of the various University bodies—that dealing with finance, for example, and that dealng with the education question, pure and simple. For that reason, I had in my mind throughout the constitution of the University of Birmingham. I was a member of the Charter Sub-Committee; we went very carefully into this matter, and all our ideas really are involved in the constitution that exists. Most of us in Birmingham are satisfied that we have a really sound and good constitution for a modern University of the provincial type.

6792. In what document is that embodied?—The Charter of the University.

6973. And it is in the Calendar, is it not?—Yes, in the Calendar and in the Ordinances.

6794. This paper was drawn up with great consideration and with regard to the warnings, as well as the examples, given by other educational establishments?—Yes. We made a rather exhaustive study of University constitutions, and I may say that this Charter of the University of Birmingham was not obtained without considerable discussion, and many of the points in it were points we had to fight for in somewhat serious fashion, because there was a local body governing Mason College which did not take kindly to all the suggestions that the academic persons put forward.

6795. But you think that those difficulties have been practically overcome?—I do. I believe we have obtained a constitution of a thoroughly sound character.

The Witness withdrew.

The Commission adjourned until the following morning.

EIGHTEENTH DAY.

LONDON.
Dec. 19, 1901.

THURSDAY, DECEMBER 19, 1901.

AT 11 O'CLOCK, A.M.

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman); The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.; The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.; Sir RICHARD CLAVERHOUSE JEBB, LITT.D., LL.D., D.C.L., M.P.; Professor S. H. BUTCHER, D.LITT., LL.D.; Professor J. A. EWING, M.A., LL.D., F.R.S.; Professor JOHN RHYS, M.A., D.LITT.; Professor J. LORRAIN SMITH, M.A., M.D., WILLIAM J. M. STARKIE, Esq., LITT.D.; WILFRID WARD, Esq., B.A.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

NICHOLAS JOSEPH SYNNOTT, Esq., B.A., Barrister-at-Law, examined.

Nicholas Joseph Synnott, Esq., B.A.

6796. CHAIRMAN.—Mr. Synnott, you live in Ireland, do you not?—Yes.

6797. In County Kildare?—Yes.

6798. And you are a member of the Bar, I think?—Yes, I am a member of the English Bar; but I have ceased to practise.

6799. I think you are a Roman Catholic?—Yes.

6800. And you have taken much interest in the subject that has been referred to us?—Yes.

6801. You have furnished us with a summary of what you propose to say. Will you just follow your own order and give us your views?—Yes. As to the general principle, I do not propose to say very much, as, probably, the Commission have had sufficient evidence on that point—that is, as to the question of whether the Catholics have a grievance and a want under existing conditions. I propose on that point to add but very little to the statements of The O'Conor Don and Colonel Ross of Bladensburg. I may say, however, that Catholic laymen, perhaps, may differ as to the methods of solution, but I do not think there is any difference whatever amongst any class of Catholics as to the fact that they have a legitimate grievance. In the solution now proposed, under the conditions suggested by the Bishops in 1897, the old plea of denominational endowment is largely removed. What we ask now is for liberty to teach, in our own way, and a form of education that we ourselves think is right. We conceive that we are the best judges, knowing the definitions of our creed and the exactness of our moral teaching, as to what we want and what we do not want. I think I may sum this up by introducing here a quotation from the writings of Richard Lalor Sheil, if you will allow me. It sums up our position, and, as I conceive, the principle upon which we go. The quotation is from a speech which Mr. Sheil made in 1845, when discussing the Maynooth grant, when Sir Robert Peel proposed to increase that grant, and charge it on the Consolidated Fund. I quote this simply as establishing the principle for the new College or University. If our demand indirectly involves denominational endowment, I say that this principle carries it. He said:—

> "Even supposing the Catholic religion to be a tissue of errors, it is clear you cannot convert us by abusing us. The Catholic Church in Ireland is an accomplished fact; you cannot get rid of it. You cannot uproot it, but you may give a useful direction to its branches; and, if I may so say, by training them along the legalised institutions of the country, make it productive of what you yourselves would be disposed to acknowledge to be useful fruit. You must take Ireland as it is, and you must adapt your policy to the condition of the people, and not to your own peculiar religious feelings. A statesman has no right to found his legislation upon his Theology."*

Next—I really do not think, unless you wish me, that I need go any further into the principle—I say that, quite independently of amount, the principle of State endowment has been admitted, not only in regard to elementary education, but also with regard to higher education. In regard to elementary education it may be said that it was only indirect endowment, that it was not intentionally a denominational endowment originally, but only that it has been worked out in practice as denominational. But, even supposing that this is not a denominational endowment, the principle is directly admitted in the endowment of Maynooth, first of all by the Irish Parliament, continued by the United Parliament, and, in a most striking case, by Sir Robert Peel in 1845, when he transferred the charge of Maynooth to the Consolidated Fund, and made it independent of Parliament—and increased the amount of the endowment. But it may be said that that was abolished in 1869. I submit to you that there was no change of principle at all. What Mr. Gladstone did was to transfer it from the Consolidated Fund, and put it upon the Irish Church Fund. But he did that by an Act of Parliament, and it was a public fund, and I say that an endowment from the Irish Church Fund is as much an endowment by Parliament as an endowment from the Consolidated Fund. What we Catholics said in 1869 was that Maynooth got too little; but the undenominationalists at that time strongly insisted that it was an endowment of Maynooth. I say that the principle of denominational endowment is admitted there. And, of course, it is also admitted, as you have already had before you in evidence, in the endowment of the Training Colleges. It was admitted, too, by the Act of 1879, which admitted the Catholic claim and abolished a University, which did not suit the wants of the Catholic people—it abolished one University and set up another which did not require attendance at the Queen's Colleges as a condition for degrees. I say, also, that you will find that Lord Mayo in 1867 admitted the principle. I shall not quote his words, but he admitted it in terms at pages 7 and 8 of the Correspondence with the Bishops at that time;† and, as I believe, there is no doubt that, although endowment was not then proposed, it was certainly contemplated.

The ground on which I submit that the Catholic claims ought to be met I may sum up thus: The education of Catholic laymen is important from the point of view of the State, social order, and sound judgment in public affairs—and still more important, now that there has been such a large extension of local government and of the franchise—to the general prosperity of the country, and in the interests of the whole Empire, and the development of those natural gifts which are now shown mainly by the defects of these qualities. I also suggest that a policy of extending higher general education to Catholic laymen would tend to bring classes together. There is nothing more clear to my mind than that the religious prejudice—or a great part of it certainly—which now exists in Ireland is based, not so much on strictly religious differences, as on the fact that classes of people do not know each other; and the Protestants, having had more or less a monopoly of education, I conceive it is a prejudice based on the better educated against the more ignorant, to a great

* House of Commons, April 4th, 1845. Sheil's speches by Mathevin (Duffy), p. 343. † Correspondence relative to the proposed Charter to a Roman Catholic University in Ireland, 1868, Memorandum by the Earl of Mayo, pp. 7–8.

extent. Indeed, I find that Mr. Wilson Croker, in a pamphlet, with which, I daresay, the Commissioners are familiar, published in 1807, and which is to be found in the Appendix to Vol. I. of his Correspondence, page 453, stated—(and he was a strong Protestant, too; I believe he either represented Trinity College, Dublin, or was a candidate for it)—he stated that what was called "ascendancy" in Ireland was based largely on the question of education against ignorance, and he urged the Catholics of that time to go for a higher education, "because that," he said, "is the way you will emancipate yourselves from that ascendancy."* My own little experience certainly confirms me in that. One cannot help noticing it, and I am bound to say candidly, that much of the prejudice (if there be a prejudice) of Protestants against Catholics, is rather based on the assumption—I regret to have to say it—that the Catholic is an ignorant man. Perhaps you will allow me to give a personal illustration of this; a straw shows which way the wind blows. I was travelling one day with a Protestant, whom I did not know very well. He was an Irish University man, and he happened to make some hackneyed classical quotation. I forget now what it was, but it was from Virgil's Georgics. However, I happened to remember the passage, and quoted the end of it. He looked up at me with great surprise, and said, "Do you know Latin?"

Well, then, I say, that we have to recover lost ground, and I lay the greatest possible stress upon this. It is true now that the Test Acts have been repealed since 1873, and that Trinity College is open—theoretically open. But, though it is *de jure* an undenominational institution and open to Catholics, *de facto* it is certainly non-Catholic, and it is *de facto* Protestant. I do not think that anyone will deny that. But my point is this, that its *de facto* state is due largely to its *de jure* condition for 300 years. Education is not like the franchise. Its effects are enduring. But not only that—I do not lay stress merely on penal laws and proscription—but the endowments of Trinity College, Dublin, and of other denominational institutions, both in higher and in lower education, were given by Parliament to those institutions as Protestant institutions, and the results remain *de facto*. Trinity College, Dublin, not only got the annual endowment, but large Parliamentary grants. The Charter Schools, which were not only denominational but proselytising institutions, got grants. According to Godkin's Book on Education in Ireland, they got grants of £1,105,869. The particulars are also to be found in Mr. Sadler's Reports on Education, published in 1896. The Foundling Hospital got a grant of £820,000, and there were other grants to the Royal Schools and the London Hibernian Society. In fact, as Burke said long ago—I have really no particular right to speak in this matter, and, therefore, I fortify my position by quotations from persons whose position cannot be gainsaid—"The plan of the Government of Ireland has been to sacrifice the civil prosperity of the nation to its religious improvement."†

And, let me say, this question is of great importance, not only to laymen, but to the Catholic clergy. I submit, from the point of view of the State, for the reasons which actuated Sir Robert Peel in increasing the grant to Maynooth in 1845, and putting it on the Consolidated Fund at a time when there was a narrow franchise, and when there was certainly more religious prejudice than there is now, that he conceived, as the Irish Parliament conceived, that it was important, from the point of view of the State, that there should be an educated clergyman in every parish in Ireland, where, to a great extent, there is a lack of resident gentry, and where there is a still greater lack now than there was in 1845. I say, then, from the point of view of the State, it is most important that there should be, in every parish an educated clergyman. I wish to add that if you give us education in the shape that we want it, the State is much more likely to get a good economic result by consulting our wishes than by giving us something we do not want. But, upon the question of the education of the clergy, let me point out that the income of Maynooth was diminished very largely by the action of Mr. Gladstone in 1869. The revenues of Maynooth, I think (I am right in saying, were reduced from £26,000 to something like £14,000 a year. I am not aware that there was any reason at the time given why that income should be reduced; it was not argued at all; it could not have been argued, that the educational needs of Maynooth were not just as great in 1870 as they were in 1869. It is quite clear that, with that limited sum, it is impossible to develop, for instance, the Arts side, the Science side, or History, in Maynooth itself. Of course, it is now a new feature of this case that the Bishops have said—I think I have read everything that has been said upon this subject by the Bishops during the last twenty years—and I think it is a new feature that they, or certainly some of them, desire that clerical students should avail themselves of an Arts course in a College or University, and I conceive that it is of the greatest importance, if you give laymen higher education, that you should also give it to the clergy. It is impossible to place the one in an inferior position to the other. The clergy are not only the leading people, whom the peasants and others will follow in the country districts in Ireland, but they are, to a great extent, the managers of the Primary Schools of the country. There are 1,184 managers of Primary Schools who are Catholic clergymen, and only 141 who are laymen. The Secondary Catholic Schools also are almost entirely in their hands. They are the teachers in the seminaries, and Bishop Healy's book on the History of Maynooth points out most clearly how difficult it is to find proper teachers in the Arts course and the Science course for the ecclesiastical seminaries, with the limited Arts course in Maynooth and its limited endowment, and he points out how the necessary limitations of the courses in Maynooth are due, in fact, to the inadequate endowment. Then, again, you have the fact that there is this new scheme of Technical Education. The clergy of both denominations, and very largely the Catholic clergy, have been elected on the Technical Education Committees all over the country, and I think very properly. But if you do not educate them to a point where their advice will be really useful, you are throwing away, to a great extent, the money you have given for the purpose of Technical Education. I have again fortified myself with a quotation from Sheil—I cannot lay my hand upon it for the moment—with regard to the question of the Catholic clergy. Both in the Maynooth debate and elsewhere in his speeches he was never tired of saying that it was most important that you should have in every parish in Ireland a refined and educated clergyman. At page 340 of his speeches he says:—

> "Locate in every parish an educated Catholic priest, whose mind has undergone a process of literary refinement, and you will accomplish much in the way of national amelioration."

Then he says (p. 341.):—

> "A large standing army and a great Constabulary force are more expensive than the moral police, with which, by means of the priests of Ireland, you can thriftily and efficaciously supply yourself."

6802. Most Rev. Dr. HEALY.—Who made that speech?—Richard Lalor Sheil, in his speech on the Maynooth grant. Of course, he was only adopting the principles which Burke, in his letter to Lord Kenmare, constantly affirmed, and, I think, also, in his speech to the sheriffs of Bristol.‡

I know that we may have the question of clerical influence raised, and it is better to face it candidly. I think it will be found historically that, so far from the clergy influencing the laity in wrong directions, it has been the other way. Perhaps it is not necessary for me to go into that, but when the land question assumed a critical stage in Ireland, there is no doubt that the clergy did in a certain way—not lead the movement, because I do not think they led the movement at all, but they took some part in the movement, and, I believe, on the whole, their influence in that movement, too, was largely on the side of moderation; and, I am convinced, that, but for their influence, you would have seen a large access, I will not say of terrorism but of unjust demands unjustly made. I am confirmed in this view of the attitude of the clergy again by the testimony of a Protestant, Sir George Cornewall Lewis,§ in his book on "Irish Disturbances." He points out there, almost from beginning to end, that in all the serious agrarian movements in the early part of the century—the Ribbonmen, Whiteboys, Oakboys, and so on—the Catholic clergy were largely on the side of moderation. Therefore, for my part, if the better education of the Catholic clergyman will give him greater influence, as it must do, I conceive that it will be, on the whole, on the side of good.

Now if proof were needed of our lack of education in Ireland—I do not know that it is necessary to go into this matter—but I think nothing is more striking

* Croker Papers. Edited by Louis J. Jennings. London, 1885. Appendix, p. 453, containing reprint of "State of Ireland, Past and Present." † Letter to a Peer of Ireland: Burke on Irish Affairs. Edited by Mathew Arnold, p. 198. ‡ Letter to Dr Hussey (1795): Burke on Irish Affairs, p 402. See also Letter on the Penal Laws: *ibid*, p. 198. § For example at pp. 30 and 140–145.

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than the small part that we Catholics have taken—I regret to have to say so—in the work that has been done in Ireland in Arts, Literature, Science, and so on. I think that in everything—if you look at the work of the Royal Irish Academy, the Society of Antiquaries, the works even of local history, and the works of poetry, where you would expect them, an imaginative people, to excel—it is most remarkable how you have largely to go to the *alumni* of Trinity College to find what has been best done on those lines. Nothing is more striking, for instance, than the low state of periodical literature in Ireland. There is really only one small magazine of any merit—the *New Ireland Review*—in which Catholics express their opinions, and I regret to say that it has a most limited circulation. Nothing is more striking than the lack of book-shops in Ireland. It is only, perhaps, in Dublin, Cork, or Belfast, that you can buy any standard literary work. All these things point to a low state of education. Nothing is more remarkable than that you find many Irish patriots, men taking the lead in popular movements, in the latter part of the eighteenth and the first half of the nineteenth centuries, coming from Trinity College, Dublin, and among their *alumni* you will find the names—the really well-known historical names—of those who took a leading part in what is called the popular side. But I shall not dwell upon that.

To come to the question of the solution. The fundamental conditions of any solution, I say in my Summary, I think, are four. First, it should be adequate, including substantial equality. I do not lay any stress at all upon formal and theoretical equality; it must be substantial equality. If it is not what we want, if it is not what laymen want, either they will not avail themselves of the education at all, or they will go elsewhere. Therefore, I think it is of infinite importance that you should see exactly what it is that we laymen do want. I may say that I speak only for myself, and I have no right to speak for anybody else; but I have endeavoured, by private conversation in every direction that I possibly could, to ascertain what it is that laymen do want in this matter. Then, secondly, as I have said, it must be acceptable to the class for whom it is intended. Thirdly, it must be final, because, in nearly every attempted solution of Irish matters their beneficent effect has been spoiled to a large extent by proceeding in stages, and by being the result of compromise. As I have said, we have to make up for lost ground, and it is most important in this matter that the solution should be final and satisfactory to all parties. Fourthly, it must be politically possible. Now, from the point of view of being final and politically possible, and also acceptable to the class for whom it is intended, I think the Declaration of the Bishops, in 1897, points out a satisfactory solution. But candidly, I do not think—and I said so in an article which appeared in the *New Ireland Review* in 1897*—that the conditions framed in 1866 and 1867-8 in the negotiations with Lord Mayo and Sir George Grey afforded the basis of a solution which would ever be agreed to by Parliament. I did not think so then, and I do not think so now. Bearing that in my mind, I then suggested that, as those conditions had not, up to 1897, been withdrawn, I did not think it was possible to get from Parliament either a College or a University satisfactory to Catholics, and that, as we had waited for thirty years, and there was not the slightest prospect (I thought) of getting an institution based upon those principles then formulated, the proper solution was to adopt the proposal thrown out by Mr. Lecky on December 20th, 1895, by letters in *The Times* and speeches in the House of Commons.† I believe, with the authority of the officials of Trinity College, Dublin, and I said that I thought the solution would be that we should go *en masse* to Trinity College, Dublin, accept Mr. Lecky's conditions, agitate, and procure from Parliament, with the consent of the authorities of Trinity College, Dublin (though, of course, that would be the first condition), such a change in their constitution as would allow us to have a proper and adequate share in their governing body, and to accept also those proposals thrown out by Mr. Lecky, that there should be proper Catholic dogmatic teaching within the walls of Trinity College, proper methods of enforcing discipline according to our notions, and also the allowing of our religious observances within Trinity College itself. I now see—and, perhaps you will allow me to say this on the history of the matter—that that is impossible—certainly politically impossible, and I do not think it is possible at all. In the first place, I do not think, on further consideration, that such a solution would be acceptable to a large body of Protestants in Ireland. I do not think it would be acceptable to many of the governing body of Trinity College itself, and I do not think that, without their co-operation and their goodwill in the matter, we could ever get the assent of Parliament; and I do not think that, even if we did get the assent of Parliament to what would be practically an endowment of denominational education—for there would necessarily be an increased endowment required for this solution—that without that co-operation it could be worked out satisfactorily within the walls of Trinity College, Dublin. I may say that what much confirmed me in this opinion was statements by leading Protestants, and, amongst others, by Mr. Cooke-Trench, who has already given evidence before this Commission. In a letter addressed to the *Irish Ecclesiastical Gazette*, which, I believe, met with a warm response from many Protestants, he declared that "the whole atmosphere of Trinity College is, thank God, essentially Church of Ireland. Long may it continue so." And he expressed himself in favour of a Catholic University or a Catholic College, because, as he said, "If Catholics went there, *i.e.*, Trinity College, in the course of a generation or two there is every reason to suppose that they would capture a majority of the Fellowships. Already a large number of our best young men migrate to Oxford and Cambridge; who can doubt that, with a majority of the Fellows and students Roman Catholics, such as we know them, this migration would be largely increased, thus adding to the disproportion already existing?" "Therefore," he says, "do not let us force upon our Roman Catholic countrymen the necessity, as their only resource, to pour upon Trinity College every capable lad in the country, with the (to them) noble ambition of capturing for their own Church one of the few remaining strongholds of ours." I conceive that the substance of that letter largely represents Protestant opinion in Ireland. I saw plainly that they were as denominational as we are, and therefore I thought that my former proposal—that we should go there and make our mark in Trinity College, Dublin—was not really a workable proposal. Besides, from the correspondence which afterwards appeared—I will not go into it; but it is quoted in an article by Professor Tyrrell in the *New Liberal Review*‡—it is evident, I think, that the authorities of Trinity College, Dublin, were not so keen on that solution at the time of that correspondence as they were when Mr. Lecky made the speech to which I have referred. And I have observed, too, that as far as changing the government of Trinity College, Dublin, is concerned, they are quite unwilling to anticipate the working out of the results of capturing the Fellowships, which, it is evident, it must take us fifty years to do. They are not willing to agree to an immediate change of government, and they are not willing, I think, to allow Catholic religious observances to take place in Trinity College, Dublin. That is my reading of it. However, I may be right or wrong upon that point; but I wish to point out that since then I have read the speech of Mr. Butt in 1877, when he brought in his Bill, and there—I do not know whether it is true or not, but I may give it as part of the history of the case—in arguing for a Catholic College, he says:—"If you had Mass said within the University of Dublin half the Protestant students would go away."§ And, from their point of view, I consider they are right. But if they are right, so, also, are we; if they are denominational, so are we.

Then I think, also, there is another reason why such a solution would not meet all the wants of the case, and that is that such a solution would not provide adequate and proper training in education for our Catholic clergy. When I wrote that article, this aspect of the question had not been brought to the front, and I did not conceive that the Bishops wanted, or, indeed, that there was any demand whatever for the education of the Catholic clerical students along with the lay students. Of course, there is another aspect of the question with which, being only an amateur, I am not competent to deal; but I am strongly in favour of any proposed new institution being strictly residential—not merely in the sense of requiring attendance at lectures, not merely that, but I am in favour of it being residential in the sense that the students should not be allowed to live all over the town and in the suburbs. I think that in any proposed institution the students should live, as at the Colleges at Oxford and Cambridge, within the walls of the College, and

* The New Ireland Review, Vol. VI., No. 6, Feb., 1897. † *e.g.*, in H. of C. 22nd January, 1897. ‡ New Liberal Review, July, 1901.
§ See Hansard, Vol. 235, pp. 1863 *et seq.*

with a proper tutorial superintendence. And I do not think, subject to the opinion of those who know more about it than I do, that there is physically, within the walls of Trinity College, Dublin, room for a large extension of residential premises.

6803. Dr. STARKIE.—I might say that in Oxford and Cambridge there is no room either; the students live in the towns?—I know; but Oxford and Cambridge are not Dublin. They are not towns of 250,000 inhabitants; and both at Oxford and Cambridge, I think, the whole town is subject to the jurisdiction of the University to a great extent. That is perfectly imposible in a town like Dublin—perfectly impossible. But perhaps you will allow me to deal with that aspect of the question when I come to the method of solution. As a matter of fact, I believe there is room in Trinity College, Dublin, at this moment, for only 300 or 350 residential students.

6804. Two hundred and twenty-five?—Two hundred and twenty-five. That confirms my opinion. If we were to pour in 500 students there there would not be room for them. Then, with regard to the proposed solutions. Really, about the *status quo* I shall not say a single word, because there has been already so much evidence given upon it—a College which is unendowed, and with an Examining Board like the Royal University—I will not say a word about that being unsatisfactory; I think it is proved. But there are three principal solutions—(1) a modified Royal University, with a Catholic College, or Catholic Colleges, attached; (2), a separate University for Catholics, subject to the conditions stated in the evidence; and (3), a separate autonomous College for Catholics, also subject to the conditions propounded in 1897, affiliated with Trinity College—that is, *quâ* College—to an enlarged University of Dublin, leaving Queen's College, Belfast, also an autonomous College or a separate University.

Of these three solutions, I do not think the first one—that of a modified Royal University, with a Catholic College, or Colleges, attached, or affiliated with a number of others—would meet the case at all. I put in my Summary that it would satisfy none of the claimants. Of course, I have no right to say anything about other claimants, and, perhaps, I should withdraw that, because I believe there has been some evidence that such a solution would satisfy some. But it is sufficient for me to say here that I do not think it would satisfy us at all. In the first place, on general principles, quite apart from our Catholic view of the case, such a University would be in the air—it would be *in nubibus*: you would have still remaining a great part of the objections to the existing system. There would be only a system of examination; there would be no seat of the University, no professoriate common to the University, and no endowment of research; and, I confess, I am against the affiliation of Colleges hundreds of miles apart, perhaps with different objects altogether. And I think, to a great extent, the authorities of a University should be in close touch with the authorities of the College. For instance, it may well be that Belfast, as a great commercial centre, may have quite a different idea of higher education from what we may have in Dublin, or elsewhere in Ireland. That is quite possible. I confess there is another reason, also, why I think it could not be satisfactory to us. It may be a sentimental one, but I think that sentiment goes for something in these matters; and that is, that if Trinity College still remains autonomous in the full sense, being both a University and a College, free to go its own way, we, as Catholics, should not be in an equal position in a College affiliated with a number of other institutions under a University Board, composed of elements from all those Colleges. I do not think it would ever be considered that we were placed in an equal position. Then I may be allowed to say that of the two other solutions I prefer No. 3, that is, an autonomous Catholic College, subject to the conditions propounded in 1897, attached to the University of Dublin, leaving Trinity College, as regards its endowment, as regards its enforcement of discipline and control of its students, lectures and Professors—leaving all that intact. I should say let us have a College of the same kind, and let the bond of union be simply the governing body, representatives from each institution; let that governing body control the standard of examination, appointing the Examiners, and generally frame the ideal and scope of the University. Knowing the narrow limits of the Reference of the Commission I shall be very careful not to exceed them. I only wish to point out, dealing with the proposed solution of a Catholic University, that whilst it is a solution—perhaps the Commission will allow me to say this—and it is only for that purpose I dwell upon the other solution, which I call No. 3—I do not think that as long as the other solution is in the air—the solution of a College affiliated with, and sharing the prestige of, the University of Dublin—the solution of a separate University would not be accepted as adequate or final by a large body of Catholic laymen. From that point of view, perhaps you will allow me shortly to state my reasons. I do not think that, as compared with the solution that I suggest, although I would far prefer a separate University for Catholics to a modified Royal University with a Catholic College underneath it, so to speak—but as between College and University—a College attached to Trinity College, Dublin, or, rather, attached to the University of Dublin—as between that College and a separate University for Catholics, perhaps you will allow me, without in the least endeavouring to go beyond the Reference of this Commission—which, however, I observe, excludes, not the University of Dublin, but Trinity College, Dublin—to say that I conceive that such a solution—that of a separate University for Catholics—would have these disadvantages. In the first place, its degree would not have, for a long time, if ever, the same value, especially out of Ireland, as those of the University of Dublin. Secondly, I think that, to a large class of Catholic students aspiring to appointments or professional careers in Great Britain, the Colonies, and so on, the current estimation of the degree would be of the greatest importance, and it would not in the least matter, from this point of view, whatever the high standard of examination established in the University might be. Would that be known outside Ireland for the next thirty or forty years? Might not the degrees of a denominational University be not only not a help, but a positive drawback, in the eyes of persons of a different way of thinking? After all, we in Ireland are only 3,300,000 Catholics, amongst a population of the United Kingdom of some 40,000,000, and then there are all the Colonies; and the evidence already given shows the enormous proportion of both Catholics and Protestants who seek professional careers outside Ireland.* I do not go into the question of prestige, and I am not sure that "prestige" is exactly the right word. But, unquestionably, the strength of a University,—not only its estimation outside, but its strength within itself,—and its power for doing good are largely based upon its history and its traditions. I again fortify myself with the opinion of one who took a leading part in agitating not only for Catholic Emancipation, but in framing the present system of elementary education, and who, indeed, in his Memoranda, which have been published by his niece, Miss Wyse, anticipated to a great degree not only the demand for higher education, but also the demand for Technical Education. I allude to Sir Thomas Wyse. In various portions of those Memoranda he dwells upon the fact that the only true solution was a Catholic College attached to the University.

6805. Most Rev. Dr. HEALY.—To what University?—To the University of Dublin. At page 91 of the "Notes on Education Reform in Ireland"—written in 1845, I think; that was after the Queen's College Bill was passed (he did not think that at all a final solution)—he says:—

> "For my part, I still remain firm in my opinion that, for the Colleges, for the country, Dublin University itself, it would be better that the old University, the venerable Alma Mater of so many and such distinguished generations, should open her arms to receive these new accessions to her glory and strength, than that a new University, with the pretensions of years, but with the fulness of youth, should be set up beside her. I should hope also to see a second College in honourable but friendly competition beside Trinity College in Dublin, and Trinity College itself, with punctilious reserve of that portion of its funds and establishment, especially destined for the education of the ministers of the Protestant Church, as open as the other College to the different religious persuasions."

Then he speaks of this University, which, he said, would then be a truly national University. It is true there that he seems to have contemplated the Queen's Colleges being under the University of Dublin, as well as the new Catholic College.

* Evidence of Dr. M'Keown. Appendix to First Report, pp. 145, 356 and 357.

LONDON.

Dec. 19, 1901

Nicholas Joseph Synnott, Esq., B.A.

6806. Professor RHYS.—All under the University of Dublin?—Yes, I think so. Sheil, also, in the debate on the Queen's Colleges, strongly urged it in these words:—

"As long as Trinity College remains the practical monopoly, though not the *de jure* monopoly, of the Protestant body, your provincial academies will be marked with all the characteristics of mediocrity, and you will only render the elevation of Trinity College all the more conspicuous by the inferiority with which it will be surrounded."

It is true he is speaking there of the Queen's Colleges. Then he says:—

"I do not deny that the advantages of education will be distributed to some extent; the measure for political purposes may succeed, but as a message of peace, it will be a failure."*

All through, in various speeches of his, he always urged, to the end of his life, that the proper solution of this matter was either that Catholics should avail themselves of the advantages of Trinity College itself, or that the Queen's Colleges should be affiliated with Trinity College, Dublin.

6807. You mean the University of Dublin?—Yes, I apologise. I wish it distinctly to be understood that, when I am speaking of affiliation with Trinity College, Dublin, I mean the University of Dublin, *qua* University. It seems to me that, if we lose the chance of sharing its advantages and prestige, we are really making a penal law of our own manufacture. We have agitated for the opening of professions of all sorts—the legal and other professions—and it appears to me that the same principle applies to the opening of the almost necessary avenues to those professions. I conceive it to be of the greatest possible importance, for instance, that students for the Bar, of both religions, should have some chance, with all proper measures taken for religious observances and religious teaching, of meeting together whilst they are students, and no people will suffer more than Catholics if they are not to meet in their student days, between the ages, say, of twenty and twenty-five, the men whom they will meet in the honourable competition of the professions afterwards. Then, from the point of view of general education, all the evidence seems to show that the multiplication of Universities, beyond a certain point, is inadvisable from an educational point of view; that it tends to lower the standard. I do not think there is a case where there are two teaching residential Universities in the same town. I know that Germany has been quoted for the number of her Universities, but I think you will find, if you compare the population of Germany and the number of her Universities that three Universities in Ireland, with her population and her conditions, would be more than the present German proportion. The population of Germany, with twenty-one Universities, is 52,279,000,† and we must remember that it is the centre of the European Continent, and it appears—I do not know whether it is correct, but I presume it is—from Mulhall's "Dictionary of Statistics," (1892 Edition, pp. 232-235) "that 11 per cent. of the students in Germany come from foreign countries." We could never hope, I think, in Ireland, to have 11 per cent. of students from foreign countries in a Catholic University. They have 1,900 Professors and 26,700 students in Germany. That is one University to every two and a half millions of the inhabitants. But if you have two Universities as is suggested in Dublin, and another in Belfast, and if you have virtually one also in Cork, where, if it is not a University, you will have a University College, you will see that in Ireland, under those conditions, you will have more higher educational institutions in proportion to the population than you have in Germany, which is admitted by all to be the highest standard in the matter. As for Austria-Hungary, I find there are there ten Universities, with 18,600 students, and a population of 42,000,000; that is one University for every 4,200,000 of the population. Besides that, of course, we cannot help remembering that the social conditions of both Germany and Austria-Hungary are very different from those of Ireland.

I say that not only should we lose the tradition and prestige, but it seems to me, from the point of view of the State, most uneconomical that, if endowment is to be made, there should not be a joint endowment for the purposes of things that can be used in common. For instance, equipment, museums, laboratories, libraries, and the higher professoriate—that is, a professoriate for teaching the honours course—and the endowment of research: it seems to me that under all these heads of subsidies to Universities, from the point of view of the State, it is uneconomical to have duplication, when these things can be shared in common, without trespassing in the least upon denominationalism, to which in Ireland so much importance is attached. As to the library in Trinity College, Dublin, whether it belongs to the College *qua* College, or whether it belongs to them as University, I do not know. At any rate, I should say that its value would not be impaired by participation, and I cannot conceive that there would be any difficulty about allowing under proper conditions the use of that library. It is really, in one sense, a national library of Ireland. It contains manuscripts and books relating to the history of Ireland, which are not to be found elsewhere. In view of the desire of the people of Ireland to know more about its past history, I cannot conceive the authorities of Trinity College, whether the library is collegiate or belongs to the University, raising any objection to the common use of the library. Indeed, in the Acts of Parliament, which allow them to have books from the Stationers' Hall—a copy of every book that is published—I had not an opportunity of looking at these Acts; I intended to have done so, but I observe that the grant to Trinity College, Dublin, is in common, not with the Colleges at Oxford and Cambridge, but with the Universities of Oxford and Cambridge.

Catholics, both lay and clerical, in Ireland—Dr. O'Dwyer has already dwelt upon this, and he has said, perhaps, in stronger language than I should be disposed to use, that we have little experience in University Education and its requirements, and I think we ought to be very willing to get the help of others in this matter upon purely secular subjects. Then there is another very important matter. There is no doubt that an enormous number of Irishmen go for professional careers, and I very much doubt whether, in a separate Catholic University, there would be a sufficient number taking up a purely Arts course to make it a success. My reading of the figures published in the Appendix is that, whilst a large number of students go in for the preliminary examinations, they do not, or, at least, only a very small percentage of them, go in for the Arts course, but the great majority of them go in for the purely professional courses. Now, I conceive it is of the greatest possible importance to Ireland that we should retain the old learning, and I confess I cannot agree at all with some remarks in a pamphlet upon this subject of "The University for Catholics in relation to the Material Interests of Ireland,"‡ in which, amongst other things, at pages 44 and 45, it is suggested that a new University for Catholics should be based upon absolutely different ideas from those of the old Universities. Although I quite agree that we should have proper training for professional careers, I think, if we are to follow the lead of Germany, we ought to realise that the best training for professional careers, and, indeed, to a large extent for higher industrial careers, is a training on the old lines. It is suggested here, at page 44 of this pamphlet, that "Trinity College has sunk deeply and almost irretrievably into the rut of the old learning"; then he says "the same with regard to Oxford and Cambridge, in which the traditional spirit of classical and mathematical lore has pretty well kept out the new learning," and that Victoria University and the new University of Birmingham are right in adopting the new lines. I sincerely hope and trust that that will not be in any degree the idea of a new Catholic University.

6808. Sir RICHARD JEBB.—What are you quoting from?—I am quoting a passage from a pamphlet called "The University for Catholics in relation to the Material Interests of Ireland," by the Bishop of Limerick. I made a resolve to be perfectly frank in the matter, and upon that point, the purely educational question, I beg to differ from him. I strongly think that if we work in conjunction with those persons who for three centuries have represented the old learning in Trinity College, Dublin, although in our own College we could work it in our own way in other courses perhaps; still I think that in the Arts course and the Science course we ought to avail ourselves of the knowledge and experience that they have there. I conceive that for a proper Arts course you must have a sufficient number of students to keep up the standard, and I doubt very much whether, with our poor population, you would have, from the Catholic population, a sufficient number of purely Art students. There is another objection, with which I deal at the bottom of the page of my Summary

*See Sheil's Memoirs, by Torrens M'Cullagh (London, 1855), vol. II., pp. 348, 349. †By the latest returns the population of the German Empire is 56,367,178. ‡A University for Catholics in relation to the material prospects of Ireland, by Edward Thomas, Bishop of Limerick. Dublin: Catholic Truth Society of Ireland. See also p. 23.

of Evidence, and that is, that if we have a separate Catholic University *de jure*—*de jure* in this sense, that the governing body are Catholic, and that, I take it, is the fundamental condition—I can conceive that the Protestants in Dublin and the Presbyterians in Belfast will say, "If your new institution, State-endowed, is to be *de jure* Catholic in that sense, whatever you may do about opening your halls and your professoriate and your degrees to all comers, if you are to that extent Catholic, we also claim to be Protestant in the same degree," and I do not know that Parliament will ever sanction a denominational system to that extent. At the present moment, of course, the governing body of Trinity College, although *de facto* Protestant, need not be so. As a matter of fact, I believe that the Provost need not be a clergyman of the Established Church.

I know the success of the Catholics in the University at Louvain has been dwelt on in the evidence. I do not at all dwell on the fact that that University is not State-endowed, but it seems to me that the conditions there are rather different. In the first place, Belgium has no Protestant population, whereas a fourth, or more than one-fourth, of the population of Ireland are Protestants. They are there, and we have got to live together, and certainly in the professions, and the higher walks of life, Protestants and Catholics must be meeting every day. There is no proposal to expel them, as far as I can make out. In Belgium the Catholic University was founded to meet the anti-religious spirit of the State Universities. Besides that, not only is there a large minority of Protestants in Ireland, but we are, for good or for evil, joined with a country which is mainly Protestant, and with Colonies where there are a large number of Protestants. It seems to me, therefore, that the position is different. Belgium has no colonies. The reasons I have given are sufficient to point out that the wants and the circumstances of the case in Belgium are not at all *pari passu* with those in Ireland. Really, if I went into the history of this matter, I could show very plainly that, almost from the very beginning, Catholic laymen and, I think, Catholic Bishops, also, have sought a solution which would allow them to avail themselves of the advantages and the prestige of Trinity College, Dublin. I really do not think it is necessary to go into it, knowing the narrow limits of the reference to this Commission, except that you should have the history of the matter upon the notes. You know that, in 1834, Sheil made his motion to open all the advantages, the professoriate, and the Scholarships of Trinity College, Dublin, to Catholics. Of course, he did not bring that forward merely as an abstract motion. He did it, I presume, being a representative Catholic, presumably with the consent of his constituents and the Catholic body, intending to avail themselves of it. At that time, I suppose, nobody ever dreamt of having a separate Catholic collegiate institution endowed. That solution was not politically possible; therefore, they went for the other, the opening of Trinity College, Dublin. That was rejected. In 1845, we had Mr. Denis Caulfield Heron winning a Scholarship in Trinity College, Dublin, and he was not allowed to keep it, on the ground that he was not able to take the oath required. Then he wrote a book in which, I believe, he argued that the decision of the authorities was wrong. However, even if they were right, he strongly urged that the University should be in all respects open to Catholics. In 1854, Mr. Fagan, the member for Cork, brought in a similar Bill in Parliament to open Trinity College to Catholics in all respects. I have already quoted Sir Thomas Wyse's opinion upon this question, and the passage I quoted is really only one of a number.* Then, in 1866-67, you had this offer by the Government of a Catholic University or a Catholic College—a denominational College; and, although that was, so to speak, in the air, that project of a Catholic University—Lord Mayo and the Government had admitted the principle—you had, in 1869, Dr. Woodlock's pamphlet—the Catholic Rector of the Catholic University. I tried to get a copy of the pamphlet, but I have been unable to obtain it. It is quoted, however, in Dr. Leebody's evidence,† and it appears that Dr. Woodlock thought the proper solution was a College affiliated to the University of Dublin—a denominational Catholic College. The importance of that is that he stated it two years after the Mayo negotiations, while there was still in the air the suggestion and the political possibility of a strictly Catholic University. Then you have, in 1870, the Declaration of the Catholic laymen, which has been referred to, drawn up by laymen——

6809. CHAIRMAN.—We have had all this very fully in detail?—Thank you. I only wished to point out that, throughout, the solution which has been favoured by Catholic laymen has been the one which I have pointed out. In 1877—I do not think this has been before you—when Mr. Butt brought in his Bill (that is, the Bill for a separate Catholic College) it was supported by a petition signed by 160,000 people, and he brought in his Bill after a conference with four of the Catholic Bishops, and I observe that fifty-five of the Irish Parliamentary Party supported that Bill. I will not go into the history of the matter, except to point out that until recently Mr. Balfour and Archbishop Walsh were both in favour of this as a possible solution, and Mr. Balfour, in the earlier stages of the controversy, professed himself in favour of a College, though he subsequently changed his mind.

I have already dwelt upon the importance of Catholics and Protestants meeting together as much as possible. As for clerical students, whatever the solution is, I say this—with all deference to persons who know the requirements of clerical students better than I do—that it seems to me that a separate house of residence will probably be required, as in Germany, where, at the mixed Universities, they have a separate house of residence, with their own discipline. And one must not forget that the same applies at both Oxford and Cambridge, where Catholics attend the Universities. It is obvious that the discipline required for purely clerical life will not be the same as that required for lay students. I remember, very well, the late Lord Russell of Killowen, who took great interest in this question, stating that if ever there was to be a solution of this question there ought to be a separate house of residence for purely clerical students. As far as the political possibility of the matter is concerned, I do not really know whether the Commission will inquire into that, but there is a precedent for a College in the case of New South Wales, attached to the University of Sydney, but I am not aware that there is a precedent for a State-endowed denominational University. The return presented to Parliament is, I think, ambiguous on one or two points; but that is the best opinion I can form. The only one I have any doubt about is the Laval University.

It seems to me that perhaps the solution of a Catholic University would raise a difficulty with regard to the degrees for Protestant women students. Indeed, it is another illustration of the fact that Protestants are as denominational as we are. Evidence has been given that if this new Catholic University were opened and the Royal University abolished, Protestant women students would not care to go to the Catholic University, and that, therefore, they would be debarred altogether from higher teaching and degrees. But it seems to me—I do not know, but probably they would not have the same objection at all to a common University, with two denominational Colleges under that University. So much for the particular solutions.

As to the general question whether it is to be a College or a University, I hope the standard will not be merely practical, or professional, or industrial; I hope that the University will not be a sort of glorified mechanics' institute. I sincerely hope that in every respect we shall have the old learning fully represented—in all respects. In Ireland, of all places, what is required is thoroughness, and not superficiality. With the peculiar bent of the Irish mind, I cannot conceive any greater loss than that they should be deprived of the accuracy and the thoroughness which a thorough foundation in the study of Classics, Mathematics, and Science requires. As for the standard—as an illustration of how competition between Universities may lower the standard—I may be right or wrong, and I had no occasion for going into this matter until I came to give evidence—but, looking at the Pass examinations for the Royal University, I was struck by the fact that they are certainly, I think, lower in standard than the examinations that we had to pass when I was a boy in school, in the top class, at the average age of seventeen. I say that deliberately, after a careful examination. I think it is true, also, that half of the boys in the school I was at could, at the age of seventeen, in the higher class of "rhetoric," have passed the B.A. examination in Arts straight away, without any other preparation at all. I have here, if the Commission want to see them, the examinations at the school I was at, and they can be compared with the Royal University B.A. examination in Classics. As to the governing body, I think there is a difficulty in having all the appointments in the hands of the Crown, cer-

*See notes on Education Reform, pp. 16, 34, and 69.

†See Appendix to First Report, p. 186.

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tainly in the case of vacancies. Unfortunately, however, admirable that may be in the abstract, in Ireland it may be referred to what is called "Castle influence," and you may have something like Parliamentary "lobbying" attempted in such cases. Whether that is so or not, I think it may be important to guard against the idea that such a thing could take place. I should like to see vacancies in the governing body—which, when constituted, I suppose, would be nominated by the Crown—filled up, partly by selection from the teaching staff, and partly by co-option. I conceive that if you appoint originally a proper governing body you cannot do better than leave it to them to select persons to fill vacancies. I think the degrees should be given only to residents—residents in the sense, not merely of attending lectures, but residents within the precincts of the College itself. I know there is a difficulty about poor teachers. It is said that a great many people cannot afford to come up to Dublin, especially in the case of a large number of teachers, who desire to get degrees; but it seems to me that that difficulty could be met by making special terms for teachers. I think that any persons *bona fide* carrying on the business of teaching could easily be proved and identified, and they should be allowed rooms at a specially reduced rate. I should like to see the Scholarships and Prizes in connection with the Intermediate Education Board take that form rather than that of payments of money. As regards the appointment and dismissal of Professors, if you have a College—not a University—I do not suppose Protestants would want to go there at all; and I do not see why you should not have all the governing body Catholics; and if you have all the governing body Catholics, say, with the proportion of laymen which has been alluded to by Fr. Delany and others—say, three-fourths—I do not think, really, that any question will arise about difficulties as to the appointment or dismissal of Professors. I do not think you need say anything at all in the original charter about their rights, in case of difficulties as to faith or morals. I think a body of Catholic laymen would, upon these matters, take the opinion of the proper ecclesiastical authorities, whether the provision was in the Charter or not. As to the Queen's Colleges, in Galway and Cork, I confess that, considering the state of Ireland, and the poverty of the great majority of the people, I doubt very much whether, if you had a new Catholic College, or Catholic University, those two bodies could be successfully carried on—for want of students. I doubt it. Each of these places is only four hours from Dublin, and if, as I have already said, you had rooms in your new residential College at a low rate, I cannot conceive students staying in Cork or Galway when they could come up to Dublin. I may be wrong; but, looking at certain figures, I really do not think there is room for this number of higher educational institutions. The population, of course, is not a complete test in this matter at all. It depends upon what the wants of the population are, and their avocations; and I do not want to see any artificial encouragement in the shape of money, or money prizes, towards professional occupations in Ireland. The statistics as to the number of professional persons in Ireland are fearful reading.* There are 1,030 persons called to the Bar; there are 400 practising barristers; there are 2,575 medical practitioners in Ireland; there are, outside Ireland, who have taken medical degrees and licences from Ireland, 3,142; there are 1,637 solicitors in Ireland; and you have, in addition to that, all their staffs of clerks—there are, of solicitors, one for every 2,600 of the population; and that seems to me, for a mainly agricultural community, something awful. Well then, in addition to that, you have the evidence given as to the enormous number of Irish students who go in for the Civil Service. For openings in the Land Commission, or the resident magistracy, for any Government appointments you have shoals of candidates. Then, on the other hand, you have the great diminution in industrial concerns, and of the number of persons employed in manufactures. I have the statistics of that, which, I think, are most instructive, and they bear upon the point of the multiplication of Universities also, and upon the question of giving this money encouragement for purely professional careers. I have here statistics which I will hand to the Secretary afterwards.† From 1841 to 1891, although the population of Ireland has diminished from 8,200,000 to 4,500,000, you have a continual increase, up to 1891, of professional persons—40,000, 44,000, 45,000, 49,000, 52,000; and then, in 1881, the proportionate increase in Ireland was greater than in Scotland, although in Scotland the population has been increasing, and not diminishing. In Ireland, in 1891, the statistics, apparently, were framed upon a new basis, including, in the professional classes, I think, teachers, and some other persons who were not under that head before; but, comparing 1881 and 1891, you have in Ireland, of the professional classes, in 1881, 198,684; and in 1891, 214,000. In Scotland, in 1891, the professional classes were only 111,000.‡ In Ireland 6 per cent. of the male population were in professions, while in Scotland only 3·9 of the male population were in professions, although, as is shown by other statistics which I have here, and which I will hand to the Secretary, in Scotland the revenue per head is considerably larger than in Ireland, and there are more than three times as many people in Scotland enjoying incomes over, say, £200 or £300, as there are in Ireland.‡ In spite of that fact, you have this abnormal desire to go to the professions in Ireland. On the question of the multiplication of Universities, according to the return of the Commissioners of Inland Revenue of the number of persons in Ireland—I do not know whether this is any test; it is not a complete test, certainly—but the number of persons in Ireland (and the test of this is the income-tax abatement return), including firms, who have an income of over £200 per annum, from the profits of professions or trades of all sorts, is only 8,120; that is, under Schedule E, Employments; the number of persons under Schedule D, profits alone, is 22,542; and of these persons 13,651 got abatements of £160, if their incomes are under £400. Therefore, there are only about 9,000 persons who have incomes under Schedule D.—profits from trades and professions of every sort, including firms with incomes of over £400 a year. Now, adding the two together, professions and employments of all sorts, you have 9,000 with over £400 a year, and 8,000 with over £200 a year.§ In addition to that, you have the test of the agricultural holdings—to come to the agricultural population. The number of holdings of under 30 acres in Ireland, is 411,000; of those, 127,000 are under £4 valuation, and 272,000 under £10. Of those 411,000 by far the greater number are very little more than cottiers—that is, under £10 valuation. Under £50 valuation there are 446,000 holdings, and if you take it that on an average each holding probably represents a family, and take each family as consisting of five persons on an average, that represents a population of 2,230,000. I do not say that there would not be a good many of those persons who would be teachers, or who, under certain conditions, would acquire a University education, but I do say that probably the number would be very small. Therefore, the number of persons that you really have to deal with is reduced to a very small figure. Then you have 100,000 paupers, and 250,000 domestic servants; and you have, in addition to that, agricultural labourers, railway servants, town labourers, industrial employes, fishermen, small dealers, clerks, carters, and so on. Then you have the Protestant population; and from what you have got left would you get the numbers for a new University, as distinguished from a College, would it be strong enough? Would it ever have the 2,000 students of which Dr. O'Dwyer spoke? Would it be reasonable that it should have, with that class of population? I think not. I should prefer to see the Colleges of Galway and Cork, not stripped of their endowments, but made high schools, if that were possible, to pave the way for the University, if they could be made denominational in the same way as your proposed College or University. As for endowment, I strongly protest against any further carving out of the Irish Church Fund.

6810. Mr. Justice MADDEN.—Has not that joint been carved out and distributed completely already?—No, sir, I think not.

6811. I was under the impression some ten years ago, when I was in office, that the last slice had been taken for purposes connected with Ireland. Since then, certainly, additional sums have been taken; but I am under the impression that it has been already exhausted?—There is a sinking fund, by which the old liabilities are being paid off. But there was a further endowment for Mr. Plunkett's agricultural scheme.

6812. There was; but I thought that was the last drop—to change the metaphor. I know there are terminable charges upon the fund; but if I recollect the circumstances rightly, I do not think it was then suggested that there was any substantial sum remaining for other purposes?—The point about it is that the Royal Uni-

* See Appendix D. First Report, p. 357. † See page 300. ‡ See Census returns Ireland: General Report, 1891.
§ Report of Commissioners of Inland Revenue, 1901, pp. 131–137.

versity is now getting £20,000 a year anyhow. There is that bit of the joint left, at any rate, and this Commission will have to consider what is to become of that money, and I suggest that that should not be applied to higher education in Ireland. The State gives nothing, now, to higher education really, when you compare what is done by the States in other countries. Their action in the past, in Ireland, has really been to perform this State function by a State endowment out of a fund for purely Irish purposes. Professor Mahaffy, of Trinity College, Dublin, alluding to these matters, has said that a characteristic method of English benevolence was to rob one Irish fund to endow another. Not only that; but as regards the Agricultural Department, I think you will find that, although Mr. Plunkett's Agricultural Department does not now get all the revenue from the Irish Church Fund, I believe there is a sort of pledge contained in the Act that it is empowered to draw upon it in the future for an increased sum. Therefore, I submit to you, that apart from this £20,000 now paid to the Royal University, under the Act creating the Agricultural Department, the revenues are already pledged for another purpose. Besides, going back, there is another reason why we should have a State endowment, and a liberal endowment, and that is, that if you examine Mr. Gladstone's financial operation in 1869, I submit that it was really an injustice to Ireland, as well as an injustice to Catholic education. At that time, although the charge for Maynooth of £26,000 a year was on the Consolidated Fund, he valued the covenant of Parliament—for that is really what it was—at only fourteen years' purchase. Maynooth got only fourteen years' purchase; that is to say, it got a sum of £372,000, whereas, if that annuity had been taken as it ought to have been taken, as a proper Government annuity—that is to say, if Maynooth had got a proper capital sum equivalent to the promise of the Government met by a charge on the Consolidated Fund, it ought to have had thirty years' purchase, and have got £423,000 more, the difference between the capitalisation of a Government promise at fourteen years' purchase, and a capitalisation based upon thirty years' purchase. At that very time, Mr. Gladstone compelled the tithe-payers of Ireland by that very Act to pay 22½ years' purchase to redeem their tithes. At the very time he was capitalising the promise of the individual tithe payer at 22½ years' purchase, he was capitalising a Government promise on the Consolidated Fund at only fourteen years' purchase, and he applied the same principle to the *Regium Donum*, and charged that at fourteen years' purchase on the Irish Church Fund. Finally, I wish to say that I hope this Commission, as it deals, not merely with higher education, will incidentally also consider the question of Secondary Education in Ireland to some extent as allied to, and connected with, higher education. The great want in Ireland, as I say in my Summary of Evidence here, is proper Secondary Schools. In spite of the reforms suggested by the Report of the Intermediate Education Commission, I think there is a great deal to be done. That Commission was, really, only an inquiry by the Intermediate Education Board themselves, and I conceive that they were limited there by the terms of the reference, and the question appears never to have been put before them which, I submit, ought to be put, and that is, whether the whole basis of the Intermediate Education system is not wrong.

6813. CHAIRMAN.—I do not think this is within the scope of our inquiry?—I thought the question of general education was one of the questions referred to you.

6814. Of course, it is remotely related to University Education?—I only wish to say that I hope, at some time or other, there will be an attempt by having only one educational body in Ireland—whether in connection with this proposed University or not, I do not know—dealing with Irish educational matters. I do not know that there is anything further that I have to say.

6815. Most Rev. Dr. HEALY.—Have you taken a University degree yourself?—Yes; I took the B.A. degree in the University of London.

6816. You spoke of a school which you attended where the teaching of Classics to the boys was as good as that that the B.A.'s have the advantage of getting at the Royal University. Might I ask where that school was?—Stonyhurst. I say nothing about the teaching. I judge only by the curriculum and the examination papers, and by the fact that, whereas the standard for a pass at the Royal University is one-third, our standard, below which we did not get any marks at all, was one-half, and, for honours, two-thirds.

6817. Have you had any academic experience as a Professor or teacher?—Oh, no.

6818. None whatever?—No.

6819. Do you appear here, might I ask, in any representative capacity, as connected with any educational institution in any way whatsoever?—No.

6820. Therefore, we must take it that they are only your own private and personal views upon this subject that you have put before us?—Yes, as one of the Catholic laymen. I have spoken to a great many on the subject, and I have met in my profession a great many. Only in that way have I gathered information as to the views of Catholic laymen. I do not appear as having any special qualification.

6821. Are you aware that the solution of the higher education question in Ireland which you prefer is precluded by the terms of our Reference from the consideration of this Commission?—I was not aware of it at all. I thought the wording of the Reference allowed the solution that I suggest, because it precluded only dealing with Trinity College as a College; I did not conceive that it precluded the notion of having an independent autonomous College with a modified University of Dublin.

6822. But any affiliation with the University of Dublin such as you contemplate would necessitate a modification of Trinity College in its government, and, consequently, is precluded from being considered by the Commission?—I did not conceive that it would operate *qua* College.

6823. It is precluded; and, as a matter of fact, several witnesses who were disposed to adopt on general grounds the line of discussion which you have adopted, were not allowed to develop that line of discussion?—I regret it very much, and I hope I have not exceeded the limits of the Reference. I only wish to point out that it is open to this Commission to say that the Reference is too narrow, having regard to the facts.

6824. I wish only to point out the reason why I do not choose at present, and why I would not consider it right further to cross-examine you with reference to those topics, because I certainly would be disposed to cross-examine you on a great many of your statements, except that I consider myself precluded from further investigating the subject except in purely academic fashion, which I think is not desirable?—But I may say, my lord, that I have said, and I say it again, that if that is precluded by the terms of the Reference, and if it is precluded also as a possible political solution, I am in favour of a Catholic University as the next best way. I think that is a far better solution than any modification of the Royal University could be.

CHAIRMAN.—Perhaps the Bishop will allow me to say that I abstained from checking the evidence, because it seemed to me to bear upon the Reference in this way, that the witness avows that he does not consider a Roman Catholic University to be the best solution, and his support of that proposal is proportionately weakened by the consideration that he much prefers another.

6825. Most Rev. Dr. HEALY.—But, supposing the question of the affiliation to Dublin University of a Catholic College is precluded from our practical consideration, what would you consider, may I ask—I wish you, if you please, to answer briefly—the most satisfactory solution? Would it be a Catholic University?—A Catholic University, most decidedly, as the next best.

6826. You seem to think that there would not be material enough in Ireland for such an institution?—I think not.

6827. Are you aware now that of the students that pass through the Intermediate Schools—this appeared in evidence the other day—70 per cent. are Catholics, and those 70 per cent. take even more than 70 per cent. of the highest honours and prizes in the Intermediate Schools? Does not that indicate that there is twice as much material—assuming that they are otherwise qualified to go to the University—for University Education in Ireland on the part of the Catholics as from any other quarter?—I think that is strong evidence that, boy for boy the Catholics are as good as the others; but I think, if you compare those statistics with regard to Intermediate Education with the number of persons who proceed to the B.A. degree, you will find an immense falling off.

6828. Yes, but it appears to me that that would be a misleading comparison at present, because what Catholics complain of, at any rate now, is that there are no facilities afforded for Catholic boys to proceed to such a degree, whereas if facilities were afforded they would proceed in much greater numbers?—I agree, my lord, that they would go in greater number. I agree that the statistics as to the number of persons who proceed to the B.A. degree does not represent properly the difference between the numbers of

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persons professing the two religions; but, at the same time, I wish the thing to be a success, and that is my chief ground for mentioning these statistics.*

6829. You were comparing the provision for University students in Ireland with the provision in Germany in numerical proportion. Why did you not compare it with Scotland? Would not that have been more to the point—where they have more Universities, and very much the same population, although that population is, as you have shown, a little more wealthy than we are, but that, perhaps, is due to the fact that they have higher education? Why not compare with Scotland rather than with Germany? It would not suit you so well, I suppose?—I took Germany because Germany has been quoted so often by every educational authority as the standard for teaching and learning we ought to go upon, and as the model of industrial success.

6830. Has not Scotland been quoted in that connection?—There are differences. I did not develop all these statistics as to the occupations of the people of Scotland, and so on, but it is most marked that the number of people who avail themselves of education in Ireland is probably much greater having regard to their occupations.

6831. If University Education in three or four Universities in Scotland is good for Scotland, why would not University Education in three or four similar institutions be good for Ireland?—I am not at all sure—it is only an assumption, I think—that the prosperous condition of Scotland is due to having four Universities rather than three.

6832. Mr. Justice MADDEN.—I am sure, Mr. Synnott, that you would not desire that any portion of your very interesting statement should convey an erroneous impression?—Oh, no.

6833. I know that from the extreme care with which you have prepared it. The matter to which I wish to call your attention very shortly is not of practical importance having regard to the range of our present inquiry, but I think it should not be left unnoticed. I was very much interested in the portion of your statement in which you said that before the Declaration of the Catholic Bishops in 1897, your idea was that Catholics should frequent Trinity College *en masse*, as you expressed it. But you suggested that such a course would not meet with approval, or, at all events, with a warm acceptance, on the part of the governing body of Trinity College?—I do not know, but I think I said *some* of the governing body of Trinity College. I am well aware that there are a large number of Junior Fellows who would not object.

6834. I say with all sincerity that I regret we cannot number you amongst our *alumni*, so that when you speak of the tone of Trinity College, you do not speak from personal experience?—Oh no; I judge only from letters in the Press, and from this correspondence published by Dr. Tyrrell in the *New Liberal Review*.

6835. You appealed to the authority of Mr. Cooke-Trench. Well, there is no man, I may say, to whom I should sooner appeal as representing the opinion of educated and thoughtful laymen who have taken an active part in Irish Church matters, and I may tell you that, as one of that body, he has already given us his opinion on the Roman Catholic claim. But Mr. Cooke-Trench would be the first to repudiate his right to speak on behalf of Trinity College, and his repudiation would be amply justified by the letter which you have brought before us; he was not educated at Trinity College?—I was aware of that. All I said was that the Trinity College authorities did not seem to be as willing as when Mr. Lecky made his speech.

6836. I assure you it is not in any controversial spirit I have raised the point; it was only to carry out your desire to be accurate?—I quoted Mr. Cooke-Trench as representing many leading Protestants, quite apart from Trinity College.

6837. That represents his individual opinion. I only deal with his authority to voice the views of Trinity College. You are aware that it was at the instance of the governing body of Trinity College—not only with their acquiescence, but at their instance—that Mr. Fawcett's Bill was passed?—I am aware of that.

6838. I refer to this matter to show that this portion of your evidence has not been quite as accurate as the rest. You suggested that they are not prepared to make provision for what you regarded as essential if Roman Catholics were to frequent it *en masse*, namely, provision for definite dogmatic Roman Catholic teaching and religious observances. Are you aware that the governing body have approved of a resolution to that effect, which was passed by the Junior Fellows?—I am extremely sorry if I made myself misunderstood. I was quite aware that they had never withdrawn the suggestion that there should be definite dogmatic teaching. What I said was that I had not observed that they had accepted the suggestion that there should be religious observances.

6839. When you have the opportunity of reading the very interesting evidence given yesterday by Mr. Lecky on that one branch of your statement—and that is really the only branch to which I refer—you will see that you are not quite accurate. There is, indeed, another point on which I should like to say a word. You have called attention to the excessive output for purely professional purposes, of the educational institutions of Ireland at the present time?—Yes.

6840. Do you not think that this suggests a development of the new College or University, in the direction of Practical and Applied Science, and the development of such professions as Mechanical Engineering?—Oh, I quite agree. But my protest was against it being merely professional. I think the basis of the very best training for any profession is a liberal education in the old sense. I do not wish to exclude that side, but I do not think the other should be forgotten.

6841. When I referred to the professions I meant what have been called the old recognised professions. But there is a dearth in Ireland of properly-qualified engineers, scientific experts, and so on?—The greatest possible.

6842. Sir RICHARD JEBB.—In your very interesting evidence you insisted—quite rightly, as I thought—on the importance of the residence of students. You say you are in favour not merely of attendance at lectures, but of residence within the walls of a College. I entirely agree with the spirit of your remarks there, but I wish to ask this question. It is evident that if the new College or University was frequented by a large number of students there might be some difficulty about finding accommodation within the walls. On the other hand, you very justly contrasted the conditions of a town like Oxford or Cambridge with those of a great city like Dublin. I daresay you are aware that at Oxford and Cambridge the lodgings in which students live when they have not rooms in College are under the control of the University—they are licensed?—Yes.

6843. And the licence is under strict conditions. If those conditions are broken, the licence may be withdrawn from the lodging-house keeper. Now, could not a system of licensed lodgings be adopted, even in a great city like Dublin? The University authorities would know where their students were living. Could it not be worked?—Not to the same degree at all. I do not think you could have the same control. I think it would be very difficult to have a proctorial system in a large city.

6844. That is not to be thought of in the same sense?—And the students might prefer to live out in the suburbs.

6845. Would it not be within the power of the University authorities to restrict their students to certain licensed lodgings?—That is possible. Of course, where the parents or the guardians of students were living in Dublin, there would be an exception in that case.

6846. Then there were other points connected with residence about which I should like to ask you. You are disposed, I think, to restrict the University degree from the outset to resident students, with an exception in the case of poor teachers, for whom you would have special terms made so that they might obtain rooms at a reduced rate. I think that was your view?—Yes.

6847. Now, as you are aware, many of those who have given us evidence have been of the opinion that, having regard to all the conditions in Ireland, it would be undesirable to start by restricting the University degree to resident students. They have indicated that, in their opinion, at all events, at first, possibly for a limited period, there should be some provision for external students as well as internal—that is to say, for students who prepared for the examinations elsewhere and presented themselves at the University only for the purposes of the examination. Should you be disposed to think, from your knowledge of Ireland, that that is so—that there are students of limited means, for whom some such provision would be desirable, at least,

* NOTE.—By this answer I intended to imply that a successful College was to be preferred to an unsuccessful University—that a University weak in numbers might hereafter, not only fail in its objects, but run risk of losing its State endowment.—N. J. S.

for a limited period?—I think it is very possible. I am thinking, on the other hand, of an attempt I should like to make to abolish the system of cramming. Although there are a certain number of students such as you refer to, there are a great many others who could very well afford to go into residence, and the question is, whether they are not a very much larger number, and whether, if you allow the degree to be taken without residence, that larger class will not still remain outside. That is the difficulty. But besides that, if Trinity College, Dublin, still throws open its degrees to persons who are not residents, I suppose the other institution will have to leave them open, too. Then there is the difficulty about women.

6848. Then you have pointed to the rather excessive output, as Mr. Justice Madden termed it, of professional workers in Ireland. On the other hand, you rightly insisted on the value of the old studies—the liberal studies. For my own part, I sympathise most strongly with you there, in desiring that those studies should be the basis of University Education, and I should think that most, or all, of us do. But this question occurs to one, in view of those facts which you have so clearly and vividly put before us as to the professions in Ireland: would it be easy to enforce the liberal studies, even in a limited measure, as a condition of a University degree in a new University designed mainly for Roman Catholics? In Italy, which is a poor country, of course the Faculty of Arts in almost all the Universities is either small or practically non-existent. In the University of Naples, for instance, the largest of the Italian Universities, at present the Faculty of Medicine is largely preponderant; in other Italian Universities it is the Faculty of Law. There are not many of the Italian Universities in which the Faculty of Arts can be said to be at all flourishing, although no doubt, they have continued to produce some distinguished individuals in those subjects. Now, supposing there were a new University, mainly for Catholics, frequented in a large measure by students of limited means, with a profession in view, and who desired a University degree mainly with a view to a profession, would it be easy, should you say, from your knowledge of the Catholics of Ireland, to exact from them any appreciable amount of study under the head of Arts—for instance, the Classical Languages, or Mathematics?—I think it would be a difficulty now, in the existing state of the Secondary Schools. That is why I hoped all systems of education, Higher and Intermediate, would be considered together. I am afraid there would be a difficulty; but even if a low standard were fixed I should oblige every professional student to pass an examination in Arts. I do not say the standard should be very high.

6849. In regard to Secondary Education, do you think that one of the urgent needs is the provision of Scholarships, by which boys, whose parents are of limited means or quite poor, could pass from the Elementary to the Secondary Schools?—Yes. For my own part, I should like to see, instead of a good deal of the revenues of the funds of the Intermediate Education Board being given as subsidies to Colleges, many of which are quite rich enough without, a larger amount given in Scholarships on condition of residence.

6850. Mr. Justice MADDEN.—Are you aware that this has been actually done by the Intermediate Education Board since the recent Act of Parliament? Are you aware that your suggestion has been anticipated, and that it is intended that, instead of money prizes, Bursaries or Scholarships, tenable in Universities, should be distributed?—I meant, not instead of prizes, but instead of the endowment to the Colleges.

6851. That a larger proportion should be given?—That a larger proportion should be given, unquestionably. I think that by far the larger amount of the revenues goes, not in prizes, but in endowments. I think two-thirds is given to Colleges, of which, although many are properly the subjects of endowment, some are not.

6852. Sir RICHARD JEBB.—I have only one other point to ask about. You defined substantial equality in the matter of University Education as equality which is not merely theoretical or formal. Could you give us, in a few words, your conception of the points included in the phrase "substantial equality" in relation to University Education?—Well, I was rather anticipating, when I said formal and theoretical equality. Absolute equality is absolutely impossible, because Trinity College, for instance, as a College, has a magnificent site in the centre of Dublin, such as we could never hope to secure. And another thing: it has traditions and prestige, which, of course, no Act of Parliament could give us. But you ask me what the elements of real equality are. I should say, first of all, endowment, equality of teaching staff, equality of ideal—by ideal, I mean to say that I do not think we could have an equal University if we had not the same encouragement to an Arts course, and to what they call, in Germany, a philosophic course, that they have in Trinity College, Dublin. And I should also have a full autonomy, always keeping in mind Trinity College, Dublin. I do not say the same system of appointing Senior Fellows by examination, but that the governing body, however appointed, should have the same powers. The other conditions contained in the 1897 proposals of the Bishops, I think, contain all the other elements of equality.

6853. Professor RHŶS.—You have touched on the question of finance. What does the Imperial Government contribute now towards University Education in Ireland? Does it contribute anything?—I do not think so. Of course, the endowment of Trinity College remains, under the Act of Elizabeth.

6854. Let us leave that on one side. Outside that, what does the Government contribute?—Nothing, I think.

6855. In consequence of that clever transaction of the late Mr. Gladstone, Maynooth, and the other educational institutions of Ireland, which were more or less dependent upon the Government, got their money from Irish funds, did they not?—Yes; they got the money from the proceeds of the disestablishment of the Irish Church. And I may say that probably the Protestants of Ireland might strongly object; they made a point that it was very unjust to endow a Catholic University out of the tithe which had belonged to another denomination.

6856. But that has been done?—Yes. You see, in the case of the Royal University, that has been done by endowing the Royal University out of Irish money. I object to that. I say it ought to have been done out of the public funds.

6857. But that forms an argument for approaching the Imperial Government again, does it not?—Yes, certainly.

6858. CHAIRMAN.—Of course, you are keeping in mind the Queen's Colleges Act?—Yes, no doubt.

6859. I mean, that must qualify your answer that nothing has been contributed?—Yes, to the Colleges as Colleges. I was thinking from the point of view of the Catholics.

6860. Professor RHŶS.—In the present state of things there is nothing, excepting what is granted to the Queen's Colleges, contributed by the Imperial Government, you say?—I do not think so; but somebody may remind me of something else.

6861. Therefore, you think it would be just to approach the Imperial Government to do something in time to come?—Certainly.

6862. Dr. STARKIE.—I think that, in your opinion, the governing body of the new Catholic College or University should be *de jure* Catholic?—Well, I should prefer to see it so. The only object of appointing Protestants would be in case we were not able to find material and strength from our own body.

6863. I do not know whether there is not something more in it than that?—I think you would get over all the difficulties which have been suggested about Visitors, the rights of Professors, and so on; they would not need defining at all.

6864. But if the governing body were *de jure* Catholic, it would differ in its constitution from the governing body of Trinity College, which is only *de facto* Protestant?—Oh, yes.

6865. But I suppose you are aware that recently, at any rate, the Catholic prelates have stated that they would be satisfied with a College which is Catholic in the same sense in which Trinity College is Protestant. Consequently, your proposal, if carried out, would go further than that which the Catholic Bishops have lately claimed?—Well, but I think the Catholic Bishops do say that in any case the governing body must have a majority of Catholics. That is implied, I think. That is the one condition that they do insist upon. It seems to me that the difference between having, for instance, on a Board of twenty members, seventeen Catholics and three Protestants, is not a difference of principle at all.

6866. But supposing the Catholics did insist upon that, they would not be quite accurate in stating that that College was Catholic in the sense that Trinity College was denominational?—Denominational in that sense—*de facto*.

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6867. But this is a question of *de jure*?—It is a question of *de facto*, too, because this is a question of whom the Government choose to appoint. There is no need to put anything in the Charter about the religion of the persons at all. You allow the Government to name the persons, and they name them; that is all.

6868. What, then, would be the meaning of abolishing tests in this University? If we abolish tests the College is open to everybody?—Yes, certainly.

6869. Students enter a College, I suppose, in some cases with the ambition of later on in life sitting on the governing body?—Certainly.

6870. Consequently, Protestants would not be on a perfect equality with Catholic students?—They would do it with their eyes open. They have Trinity College to go to if that is their ambition.

6871. No doubt. But my point is that the Catholic College, in that case, would be more denominational than Trinity College, because there would not be perfect equality?—I think the answer is that, as a matter of practice, in the future, if that College remains *de jure* Catholic, in that sense. Trinity College would for ever remain *de facto* Protestant. I think that would probably be so. I do not believe the Catholics would go to Trinity College; and if the Catholics did not go to Trinity College, and the Presbyterians kept to Belfast, Trinity College would be left in the *de facto* position that it is at present in.

6872. Would it not seem to you rather absurd that both of these Colleges should be called undenominational, if one continued *de facto* Protestant, and the other was not only *de facto* but *de jure* Catholic?—It is a big word—"undenominational"; but I think, from the point of view of the State giving the money, it is a sufficient condition that the College is open to everybody if they choose to go there. In the Charter or Act of Parliament I would not allude to the fact that the persons on the governing body were to be Catholic or Protestant; I should leave that to the Government. If they did not appoint a Catholic governing body the money would be wasted, because Catholics would not go there.

6873. Mr. WILFRID WARD.—You have evidently made a somewhat close study of the population of Ireland, with a view to ascertaining what proportion of the population would be available for the increased facilities for University Education. We have had several estimates given of the probable number that would avail themselves of such facilities, in addition to those who at present frequent Stephen's-green and the Queen's Colleges. Could you give us any idea as to about what is the additional number you think would be likely to avail themselves of the increased facilities, say, in the course of ten years, after the system has had time to get into working order?—Candidly, I really could not. The statistics, unfortunately, are only to a very small degree based on religious differences. I mean to say, when you go into the question of occupiers of land, there are no religious differences named; it is only a question of numbers. I think that 2,000 is altogether out of the question; and I think that 1,000 is, also, a high estimate. I think so; but it is impossible for me to say.

6874. Have you any view as to what proportion of the successful Catholic candidates in the Intermediate examinations would be likely to avail themselves of University Education?—I do not know. Judging by the careers which it has been ascertained these Intermediate candidates go in for, I think a great many of them would not avail themselves of University Education. A great many of them go in for the Civil Service, which they enter at an age which is under that at which they could possibly go to the University; a great many go to be clerks; a great many become doctors, and I do not think, perhaps, would be able to afford to go to a University, although I should like to see all doctors go to one. I imagine the medical element would be the principal element. The number at the Bar is necessarily very limited. I do not know; it is really very hard to say.

6875. Mr. Lecky mentioned, as one of the reasons which tend to make the number not so very large, the apathy which exists among Catholics as to University Education. Should you think that that was greatly the effect of the absence of a University, which cause would cease to exist if a Catholic College or University were established?—That is obvious. It is obvious that the apathy is an apathy with regard to a thing of which they had no experience. There must be apathy amongst a large number. You do not find any apathy among Catholics in Ireland who know anything about it, who have mixed with others, who have seen what an enormous disadvantage it is not not to have had a liberal or a higher education; I do not think you will find any apathy amongst them. Certainly in the profession of the Bar it is an immense loss not to have been at a teaching University.

6876. You think the apathy is due simply to the absence of facilities?—I have not seen much evidence of that apathy in late years at all.

6877. You think it rather belongs to the past?—Certainly.

The Witness withdrew.

OLIVER J. LODGE, Esq., D.SC., LL.D., F.R.S., Principal of the University of Birmingham, examined.

Dr. Oliver J. Lodge, F.R.S.

6778. Professor EWING.—You are Principal of the University of Birmingham, and you have large academic experience. You are a Doctor of Science of the University of London, and you were for many years Professor of Physics in University College, Liverpool, which is part of the Victoria University?—Yes.

6879. And you have given your attention to various parts of Physical Science, and also to the application of certain parts of Science to industrial purposes; especially electricity?—Yes—Pure Science mostly; applications to some extent.

6880. We had yesterday, from Vice-Principal Heath, some account of the organisation of the University of Birmingham and, therefore, it is not necessary to detain you by asking you to go over the same ground. We gathered, I think, that the University of Birmingham has sprung from a recognition on the part of the community there of the value to the community of higher general and technical education?—Yes, I believe entirely that that is so. It started with Mason College and has developed into a University, chiefly through the action of Mr. Chamberlain, who is very much impressed with the desirability of improving the Scientific and Technical Education of the country.

6881. And the University is not exactly on the familiar lines; it has some more or less novel features I think?—Well, it aims at having a number of large technical departments in alliance with certain scientific departments, and those, I take it, will be the novel features; otherwise it is practically—well I need not repeat, perhaps, what Dr. Heath has told you. It has the usual Faculties, though on a comparatively small scale. We rely a great deal on the future.

6882. You yourself, I think, have given a great deal of consideration to, and have written much on the general question of education?—Yes, I am extremely interested in it.

6883. And I think you have strong views in particular as to the importance of higher Technical Education from what I may call the standpoint of national well-being?—I have. I am impressed with the importance of what I should call Scientific Education; though I do not wish to discriminate between it and higher Technical Education, we may regard both as much the same thing.

6884. I imagine they are. In fact I was going to ask you next whether you consider the teaching of Science in its special relation to industry is, in your opinion, best done within the University or outside the University?—I think it is very much the best done within the University, so that the students who are learning a particular branch of technology shall, in the first instance, mix with other students who are engaged in other pursuits, and not follow merely a narrow technical curriculum; and also because they can get scientific training in the principles which are common to all technical applications, and some educational training also in general subjects. I think it would be a disastrous thing to the country to be supplied with purely technical instruction in subjects which cover each a special narrow field. The advantage of such schools in connection with a large establishment for scientific training may be apparent.

6885. Have you, in your own experience, found that there is, on the part of the industrial community, considerable demand for men who have had a sound education in scientific principles?—Well, I believe there

is in Germany. In the technical works there they look chiefly at general education: they want a man who knows scientific principles; but they do not care very much about his understanding the technology of their process: that he can soon learn if educated. In this country I do not think that is so. I think that here manufacturers have some prejudice against the scientifically trained youth, and I am not sure that they are completely wrong there. There is generally some reason, and I think the men have not been sufficiently trained in a useful and practical direction to make their services of value. Sometimes teachers have been faddists, and so incomplete in their studies, that there has been a certain amount of reason to justify the feeling with regard to some examples of College-bred youths as to their Science training. I think the feeling is dying out, and I am perfectly certain it will die out as soon as we can supply a better student.

6886. You think that feeling has arisen very largely from the fact that in many existing Universities there is rather a divorce between Pure Science and the applications of Science?—I think it is due partly to that, but I think it is also due to the prevalent ignorance of scientific principles in this country. It is very difficult for a man who knows no Science, but who knows well the ordinary processes, to make use of the scientific knowledge of a man of less than first class ability. They do not know how to put questions to each other, they do not understand each other, they do not in fact speak the same language. Therefore, I think, taking into account the two sets of conditions that I have described, we might proceed to deal with each otherwise than we find is the case at present; and I would say that the more we spread scientific knowledge among those who have practically to apply processes, and the more we teach the practical application of processes to those who possess the scientific knowledge, the better. I hope that I make myself clear.

6887. In my own experience—and I should like to know whether yours bears it out—I have observed that there is a large demand at present for young men who have been trained in electricity viewed from a practical standpoint, of men who have been trained in the principles of electricity, on not merely abstract academic lines, but with special reference to the practical applications of that Science—have you had experience of that?—Certainly. I think it is extremely easy for men who have been trained in what we call electrical technology to get positions, and that the demand for such is very large. Indeed I have been surprised at the facility with which men, not even of first class abilities, get remunerative posts, and do well in them. I also think, and I have heard, though I cannot remember the instances to name them, that there is evidence that the manufacturers are beginning to realise the importance of a training obtained in College, whether in electro-technics, chemistry, or other sciences.

6888. I do not know if you have any acquaintance with the existing arrangements in Ireland for the teaching of Science in its application to industry?—I have hardly any knowledge of Irish education. I know very little about it. I have seen the Royal College of Science and other places in Dublin and Belfast, but I have no real knowledge of Irish education.

6889. You would not consider it a wholesome state of things I suppose, if you were told that in the Queen's Colleges, notwithstanding the existence of departments of Engineering, there have, for many years, been no students presented for the degree who had any acquaintance at all with Applied Electricity?—No; I think the line of demarkation between Mechanical Engineering and Electrical Engineering is rapidly breaking down, and that thus all engineers take a course of Applied Electricity.

6890. Another point upon which, I think, the Commissioners would like to hear you is as to the cost of adequate appliances for teaching Science in the way in which a University should do, having regard to the requirements of industry. You have somewhat large views about that in Birmingham?—They are very large views indeed. They are now, in fact only yesterday, it is public property so there is no harm in my mentioning it here, the Council passed a resolution to spend a quarter of a million entirely on buildings for technical branches, largely for Engineering, Mining, and Metallurgy, and some of the amount also on Applied Chemistry—that is not for the purely scientific departments, but for the applications of that Science to industry; and the fittings and equipment will amount to a great deal in addition.

6891. It would be very much to be deprecated, would it not, that in the same city there should be an attempt to set up more than one institution in which such appliances had to be provided?—Certainly; anything like competition is suicidal. That is one great advantage in Birmingham, the Municipality manages the Technical School, and there is also the Midland Institute, but the field is marked out between us and them, and there is no overlapping and no competition. Competition would be ruinous, very expensive, and of no use.

6892. Speaking of the functions of your University, I think nothing has yet been said about the improvement of knowledge, which is one of its most important functions?—Do you mean research?

6893. Yes?—Well, I think everyone agrees that research, that is to say, the advancement and improvement of knowledge, is one of the most vital occupations of Universities. Without it they cannot keep fresh and living. It is true of every subject, not only of Science. A University, I take it, is a corporate repository of learning, and if that learning is not improved it will deteriorate; those who have the learning must always be seeking to improve or advance it, as the case may be. By improving it they may occasionally advance it, and if they fail to aim at that they must lag behind; they must lose what they have got.

6894. As Professor in Liverpool you had, for many years, experience of the working of a federated University, a University in which there were associated three Colleges in separate towns. Can you favour the Commission with your views as to the general advantages and disadvantages of such a federation as compared with what may be called a multiplication by separate Universities?—Yes. I would not like to be taken as representing Victoria University in anything I may say now, because naturally it has been a controverted point to some extent. I think you would find, if you had a representative from Leeds before you, that they, at present, rather believe in the federal system; but I think I am right in saying that a representative from Manchester would say that the federal system had been as it were, forced upon them, that they had not wanted it, and that they had wanted a University of Manchester. I have no doubt that in the future there will be a University of Manchester. I think a University and a city are naturally associated. If you had a representative from Liverpool you would find that they do not like the federal system; that they feel cramped by it, and that they very much want carried out there the principle of one city one University. And I believe that that will be ultimately the general opinion. In the Midlands, in our case, for a long time there was a proposal that we should be called the Midland University—that we should cover the Midlands as the Victoria University covers Lancashire and Yorkshire. Mr. Chamberlain was always against that, and wanted a University of Birmingham, and he led us to think the same, and I for one was with him. And I think it is far wiser not to have the identity of the University spread over the Midlands, but as in the ancient practice, to have the name of a University associated with the name of a city. Otherwise you lose some local patriotism. Local patriotism does not exist in an assemblage of such places as Manchester, Liverpool, and Leeds. They are not accustomed to act together; they are accustomed to act in emulation; and emulation is good, but trying to work together is sometimes—trying.

6895. Do you know anything at all about the system under which the Queen's Colleges are more or less associated in connection with the Royal University of Dublin?—I am not clear about it; no.

6896. Part of that system is that persons who have not received an education at any of the associated Colleges may present themselves for degrees equally with those who have received such an education. The examinations are open to external students. Have you anything to say as to such an arrangement as that?—Well, I know it was tried in the London University; I do not mean the London University as at present constituted. The University started with certain affiliated schools and Colleges; but they began to admit external students, and it was found that affiliation had no meaning, that affiliated institutions had no advantage to offer to the students, and so it became a mere name. That is all the experience I have on the subject.

6897. One point of detail is all I think I need ask about now. In your own scheme for graduation in the University of Birmingham, I think you make provision for giving some of the marks on which the degree is conferred for class work instead of depending entirely

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upon the result of the final examination?—Yes, and I think that it is a very important step, and I am very glad we have been able to carry it. I tried to carry it at Liverpool, but found it impossible under the federal system, because we found that we could not have the other Colleges with us. They have adopted it at Birmingham, and the students are marked all through their term in every department, and credit is given for the whole term's work, and not only the final examination. That plan keeps a good hold on the students, who work much better than they otherwise might, and I think the result is more dependable in the end.

6898. At Birmingham you have no residence on the part of students in the sense in which the term is understood at the Universities of Oxford and Cambridge?—None.

6899. Do you find, notwithstanding that, that you have still a considerable amount of association among the students?—Yes, there might be more, and I am trying to encourage that. We are rather deficient in that respect, which is partly owing to the lack of students' rooms; we have no proper club rooms that might be the means of a good deal of collegiate life. In spite of this, however, there is some growing up, and, as I have said, we are doing our best to encourage it

6900. Was it so at Liverpool also?—Yes, certainly; I am trying to think whether it was more so at Liverpool. I think, on the whole, it was almost more so at Liverpool.

6901. I think you have lately been giving much attention to the relation between Secondary Schools and Universities, as far as the question of examinations is concerned. I would ask you in conclusion to state your views on that point?—Well, it is a big subject. Do you mean with reference to Matriculation?

6902. On any point you think would be helpful to the Commission?—Well, briefly, I have doubt whether the action of the Universities has always been beneficial to Secondary Schools. I have found in the entrance Scholarship system a tendency to encourage premature specialisation and over-pressure on, say, one narrow branch of study, and I should, therefore, like to see the Scholarship examinations placed on a broader basis. And, with reference to entrance examinations—take the Matriculation of London, for instance—its effect has been to take away pupils from their regular work, and put them for the last year in the coaching class for Matriculation. It is the practice, and it pays to do it, but I do not think it is education. It has also been used as a school-leaving examination, but I do not hold that any perfectly uniform examination is well adapted as a school-leaving examination for every class of school. I would like to see the schools themselves responsible to some extent for the school-leaving examination, but as to the machinery by which that could be accomplished, I will not enter into the consideration of that now. But, taking into account the very different scope-field and aims of different schools, I certainly think that the examination test applied could well be modified. I would get the Universities, if I could, to accept some such school-leaving examination as an equivalent to or as excusing certain subjects in their entrance examination, and not try to force the schools under any authority; except to this extent, that each Faculty might say which subjects it would admit, which subjects must be taken, in order that the student might be led to study in that Faculty, and with some other reservations.

6903. Professor BUTCHER.—You have had experience in the Victoria University, and there are one or two points on which I think the knowledge you have obtained would be useful to the Commission as regards the working of the federal system. I think it is the case that in most subjects, whether of Arts, Science, or Medicine, the papers set in the three different Colleges are common for the degree examination; but that there are some exceptions to that rule, and that certain papers are different in each College?—I cannot think of any.

6904. If my information is right—I have no knowledge of the Victoria University—but, if my information is right, it is the case in the practical examinations in Medicine?—Yes, in the practical examinations in Medicine and the practical examinations in Physics.

6905. Yes, and also in the examinations in Biology, where there is practical work, it is required that each College shall hold its own separate examinations, which are conducted by the internal Examiner, that *is*, the Professor, in conjunction with the external Examiner?—Yes.

6906. And what I wanted to ask you now is this, whether you know or have heard at all how that system of allowing the Colleges to have their own separate examinations works, and whether it is capable of further extension to other subjects than those in which it already prevails?—I have never heard it criticised, and, in fact, I have not heard it put forward with the emphasis that you have put on it just now, because it has seemed to me only a slight practical convenience. We consider the examinations to be the same in all the Colleges.

6907. Entirely?—Yes, all the practical examinations were set by the different Professors. The papers are all sent in by each of the Colleges.

6908. The papers are submitted to Boards which approve of the whole?—Yes.

6909. Then, in those cases where each College has its own separate and distinct examination?—Only in the practical part of the examination; it is not the whole of the examination.

6910. But the reason I lay some emphasis on it is this, that in the case of a federal University I suppose there is one danger, one probable danger, among others, that the separate constituent Colleges may be somewhat trammelled in their teaching and examinations by the controlling power of the University?—That there may be too much uniformity and not enough freedom. I think there is a tendency in that direction, and I have heard it most expressed on the Arts side.

6911. Yes. And the suggestion I made really was this: whether it might be possible, if there were a federal University set up in Ireland, to avoid this drawback, which attends a federal University, by giving to each College far greater freedom in *setting its own curricula*, and carrying out even *its degree* examinations, subject, however, to control as regards standard by some representative or representatives of the University. Do you follow?—Yes. Well, as a general rule, I am quite in favour of trusting the teachers to conduct the examination to a very great extent. I think it is only fair to the student that he should be examined on what he is taught; and if the teacher is bad, the external pressure is of very little use; we must get the best possible teacher.

6912. But I think you would prescribe that in order to keep the degree on a uniform and adequate standard, there should be this representation of the University by the external Examiner, while at the same time more value should be attached to the actual work done by student and teacher in class-work, in the course of their session, than is at present possible?—Yes. When I said I would trust the teacher, I did not mean that I would trust him without any check at all. I think the external Examiner system works quite well, and I also think that the method of term marking necessitates something in the nature of a check.

6913. And what do you say to the two-fold suggestion: If you combine both these methods, the method you have instituted at Birmingham, as regards attaching a certain value to the work done in class, and also the plan of leaving a much larger freedom to the Colleges, in making a syllabus of study, and carrying on the degree examinations than at present, might you by that means obviate some of the defects which manifest themselves under the federal system?—I think it is extremely likely. I do not know whether you have taken as yet any evidence from the Welsh University.

6914. Not yet. We are going to hear some witnesses later on?—Probably it will help in the elucidation of the point to which you have just referred.

6915. Professor RHYS.—In relation to the working of the Welsh Colleges, you are aware they had a number of separate schemes of studies of their own, or more than one scheme, we will say, which they submitted to the Senate of the University?—Yes, each College drew up its own calendar, and its own prospectus of studies, and then they submitted it to the University Board as a sufficient curriculum for the examination, and it was always practically passed as sufficient. If it had not been it could have been amended.

6916. Was there a tendency for those schemes to become the same in all the Colleges?—Well, I know more about my own subject than about the others, and I never felt myself cramped or hampered at all.

I made my own schemes entirely. And I think the other Colleges did the same; but whether in any of the subjects there was any feeling with regard to that I do not know. You see, we had a number of students who were not University students—Engineering students and others. The curriculum I drew up was more than was needed for the pass examination a good deal, and in the Honours examinations one had much more autonomy and elasticity, because it is impossible to set an Honours paper as to cover the whole ground.

6917. Just so?—And each College may specialise a good deal.

6918. That was very much my impression of the working of the federal system in the Welsh University?—Yes.

6919. Professor LORRAIN SMITH.—Following up the question which Professor Butcher asked you: would this term-marking system, which you have introduced at Birmingham, not eliminate the practical examination to a large extent from the degree work?—It minimises its importance. In some departments we have retained the practical examination, but it is almost optional whether we do or not.

6920. I see you have gone that length with the degree examination?—Dr. Heath, I imagine, gave you evidence upon that point, and if I were to contradict anything he said I might be misleading you, because he is more likely to be right.

Professor BUTCHER.—He told us something about the term-marking and the value attached to it.

6922. Professor LORRAIN SMITH.—It was still a difficulty. I was impressed by a need of a way out of the difficulty—the difficulty which has been put before us, having two examinations not identical in different Colleges for the same degree—and if the examinations could be fused, of course it would be an advantage?—I should like to say myself that I have not very much faith in practical examinations. I do not know whether Professor Ewing will agree with me, but I believe far more in the laboratory work done during the term than by putting a fellow down before an apparatus which he has never seen before.

6923. Professor EWING.—The practical examination is not of much use in itself; it is only useful as showing the students' knowledge?—It is quite useful as a purgatory.

6924. Professor LORRAIN SMITH.—Now, let me ask you with reference to another point: You spoke about the importance of research in the improvement of knowledge. Have you any rule, or do you contemplate any definite arrangement in regard to that in the way of Fellowships or appointments, which are practically, or in the main, devoted to research, or do you expect a man to use his own time and opportunities in that direction?—It depends whether you are speaking of the staff or the students.

6925. I am speaking of the staff, in the first instance?—No; there would be no Fellowship for a member of the staff. He would have to use his leisure time, which is, unfortunately, very often very small, but, still, I think they all feel that if they did succeed in doing anything, the College is pleased and reaps some kudos. I would say that research is in every way encouraged, except by the press of work, and, in my own case, for instance, at Birmingham, I have been specially provided with a research laboratory.

6926. Yes, so I understood; but I was wondering whether the University contemplated making a general provision in that direction?—It has not yet done so. Of course, there are the 1851 Exhibition students.

6927. But, then, the charge is brought against men who do a great amount of research, that they are bad teachers, having consumed their energy and time in research?—It is not a right thing to do that. In our University that question has been dealt with by the regulations. We have one clause which stipulates that the Professor is, in the first place, to advance knowledge to the best of his power. Well, I would not put teaching in the second place. Of course, teaching he must do, but I would put both teaching and research together.

6928. One other point I wish to ask you about, as it is a practical problem which is before us: You say that the recognising by the one University of Technical Schools would be suicidal: it would lead to competition, whereas the different fields of work should be marked out. Dr. Heath spoke of that as to that difficulty having been overcome by having representatives on the different Committees?—Yes.

6929. That is to say, that the Committee of the Technical School will have representatives on the Committees of the University—would you regard that as a perfectly sufficient arrangement?—I do not know whether it would be. There is no temptation to compete that I see at present. If our interests began to clash I do not know really what would happen. We have five city representatives on our Board, and a number on the Technical Board.

6930. The problem arose in connection with the Heriot-Watt College at Edinburgh, and the arrangement they came to without any great difficulty gave the maximum of co-ordination without interfering with each other's functions—in fact, that each institution should supplement the other?—That is a desirable and commonsense thing. If you got business men on both Boards they would try to do that.

6931. Have you marked out the different fields of work in any way?—Yes, because the work of the Technical School is nearly all evening work, and we have found that if we started evening classes, we should compete with the Technical School.

6932. Would you recognise a student qualified at a Technical School, as qualified for a degree?—There you come upon the question of affiliation.

6933. Well, that is just the point I have before me, as a practical problem?—We have a scheme in the air at present for affiliating institutions by allowing such institutions to train up to our Intermediate, but not beyond it.

6934. I see?—Two years' attendance there to count as one with us, and after the Intermediate they must come to us.

6935. Then that would be recognising an evening class student as a University student?—The institution would have to be affiliated; they would have to show they were properly equipped, and we should inspect them in respect of laboratories, list of teachers, and so on. Moreover, we do not count anything towards Intermediate until they pass the Matriculation. Now I think the technical boys would find it rather hard to pass Matriculation. That, however, is the point I wish to take into special consideration—about youths coming from the Technical School.

6935A. I think it was Mr. Sidney Webb, of the London Technical Board, who put it before us as a general principle that in a modern University it was immaterial in the interests of technical subjects whether a student's work was done in the day or evening, so long as it was done at classes which fully qualified him, and that the fact that it was evening work should be of no disadvantage to the student?—I should like to say that that would be so up to the Intermediate stage; but there is a strong feeling among us that those who are coming to us for a University degree must be willing to give their whole time to the work for the final stage—two or three years, or whatever it may be; and we will not admit them on evening work, because we do not think it fair.

6936. In the Edinburgh institutions they have recognised the teachers as *ex-officio* Examiners in the subjects in which they have taught?—That is in the Heriot-Watt case.

6937. Yes, that is in the Heriot-Watt case. Has that been contemplated in your case yet?—No, it has not yet; but I can conceive that it might be. There might be a general principle of letting teachers examine, or, at all events, letting them take part in the examinations with an outside Examiner.

6938. Sir RICHARD JEBB.—You said, in reply to a question put by Professor Ewing, that you would like to see the entrance Scholarships at the University placed on a broader basis. The system of entrance Schoalrships at a University has an important bearing on the subject which has been referred to our consideration, and I should like to ask you in what sense you intended the words "on a broader basis" to be used. You said you thought that in many Secondary Schools the tendency was towards too much specialisation, and my impression was that the broader basis you meant was that the entrance Scholarships to the University should be made a better test of general education and intelligence. Was I right?—That is what I meant exactly; yes.

6939. Now, at Oxford and Cambridge the entrance Scholarships to the Colleges are, as a matter of fact, generally gained by boys of very considerable attainments in special subjects—in Mathematics or Classics, for instance. They come up from schools where those subjects are very thoroughly taught. Do you think it would be an easy matter to make an examination for an entrance Scholarship to a University a good test

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of general education and intelligence, when the competitors are presumably clever boys who have, by the force of circumstances, been obliged to specialise to some extent at their schools? I mean, would it not be necessary to introduce some very considerable reform in the methods of Secondary Schools, especially in the higher forms, before the examination for entrance Scholarships could be made what you would like to see it, and what many of us would like to see it?—I am afraid I spoke with the notion that the teaching of the higher forms in the schools was influenced by the Scholarship examinations set up by the Universities. I took it rather the other way.

6940. I agree with that. I think the Universities have had very considerable influence on the studies at schools; but still, it is difficult to see how, practically, in the higher forms of our public schools, the training the boys receive could be made such as to fit them for the kind of entrance Scholarship examination you contemplate, without some very fundamental changes?—Well, I confess that I should like to see some fundamental changes introduced.

6941. Precisely. Would you indicate what kind of changes you had in view?—Well, I often think that at the school age information is piled in to a rather over-high standard in some subjects, and not a broad enough basis laid for general education. I think that is partly due to historical causes; but the distance to which boys in a classical school go in Classics seems to me rather high. It may be more my ignorance of the subject which makes me think that; whereas, other subjects, with which I am more familiar, seem hardly touched at all. I would like to see the average school boy turned out a generally better educated youth, because on the present system, in many cases a boy has been given an education which for the average youth results in nothing at all; and often, when he comes to us he has learnt to neglect his work. I think the system of the schools, from the point of view of the average boys, is not at all satisfactory.

6942. There is only one other question I desire to ask you. This has also a direct bearing on the subject of our Reference. The distinctive feature, or one of the most distinctive features, of the University of Birmingham, is a provision for scientific education. I believe this forms, sometimes, a training in subjects altogether technical, and of industrial value. For instance, I think there is a school of brewing. Now, would not that distinctive tendency have somewhat of a harmful influence from the educational standpoint? In other words, how is it proposed to provide for a liberal education, including literary training, as the basis on which the superstructure of technical training is to be erected? Do you feel, or apprehend any difficulty in securing that these highly technical studies, such, for instance, as the art of brewing, shall be founded on a liberal education?—We give certificates, diplomas, and degrees. The certificate, and the diploma, will involve little more than a technical training, combined with a preliminary scientific training; and the degree, I should hope, would always involve some amount of literary training in addition. That is what I want to see. I want to control it so that the perfectly unlettered, those who go for the diploma only, will not have a degree. And I should like to speak of that brewing question, because it is rather a unique business, and most interesting. When I went to Birmingham I found it in full working order; but its operations are not generally understood. The students who come for brewing go, first, for two years for Physics and Chemistry and Biology, and such subjects, and after that they enter the brewing department and work another two years. We wanted them to call the Chair Fermentation, or Applied Bacteriology, but they would not have those, they said it must be Brewing. I think they were right, but the term is misleading. His Majesty's Commissioners came and saw it; and I think they thought, that for a brewing school, it was very flourishing, though small, and at last they said to the Professor, "Where is the finished product?" whereupon the Professor replied to the effect that during all the years they had been at it they had not arrived at a specimen of the finished article—the operations are not those of ordinary manufacture. What we study is the testing of material, and, from a really scientific point of view, the whole of the processes involved, and the work of the school is highly effective in that sense. I am inclined to think that it is possible to make great use of the teaching of any practical subject. There is hardly anything, if well taught, that cannot be used as a medium for education. I do not think that, in themselves, the training in the processes is of such great value, but the students' faculties are cultivated. It is not so purely technical as one would think; but, of course, it depends on the way in which it is done. It must be done on a scientific basis, and it ought also to involve the encouragement of a more liberal training if they go on for the degree.

The Witness withdrew.

W. J. M. STARKIE, Esq., LITT.D., Resident Commissioner of National Education in Ireland, examined.

Dr. W. J. M. Starkie.

6946. CHAIRMAN.—Dr. Starkie, you have kindly fulfilled the promise you made to your colleagues, and have prepared a paper dealing with the historical matters to which you had incidentally referred to in the examination of a previous witness?*—Yes, my lord; I have confined myself entirely to the historical questions that were raised, and I have endeavoured—I don't know whether with success or not—to keep my own opinions out of sight all through. I think I should save the time of the Commission by suggesting that this statement should be taken as read?

6947. Yes; we have all seen it, and I think that would be a very convenient course, because it is rather lengthy, and would take a very long time to read; but you may depend upon it that it won't have less of our appreciation because of that convenient way of placing it before us?—Very well, my lord.

DR. STARKIE'S MEMORANDUM.

The first attempt to offer to Catholics a system of education not based on proselytizing principles was made in the Report of the School Commission (presided over by Provost Hutchinson) in 1791. In that Report the following passage occurs:—

"We beg leave to submit to Your Excellency as our decided opinion, that there should be no distinction made in any of the schools (charter, parish, diocesan, and Royal schools) between the scholars of different religious persuasions, and 'that the Clergy belonging to the respective denominations should attend for the purpose of instructing the children belonging to their respective communions in the principles of religion'"—(Endowed Schools (Ireland) Commission, 1858, Doc. Ev., Vol. II., p. 341.)

The Report recommended that in the parochial schools a system of united secular and separate religious education should be introduced.

This is the first appearance in history of a phrase so well known in National Education since the issue of Mr. Stanley's letter instituting the Board of National Education.

In connection with this Report the House of Commons recommended the erection of a second University (*Journ. of H. of C.*, vol. xii., p. 274):—"The object of a second University might be completed by taking several of the great endowed schools and blending them together in a new model" (*Parl. Reg.*, c. vii., pp. 486–492). It was proposed that there should be an Episcopalian Protestant University and a dissenting University, controlled by Catholic and Protestant teachers. But such a scheme, which is virtually that which was subsequently carried out in the Queen's University, was strongly opposed by liberal Episcopalians. Mr. Griffith said, "It does not extend to the education of the Roman Catholic and Presbyterian youth of this country. It may be answered they are not directly excluded; but I say they are virtually so, unless pastors of their own persuasions are appointed to instruct them" (*Parl. Reg.*, vol. vii., p. 503). In consequence of strong opposition, this "hybrid policy" remained in abeyance for many years, and the policy of free development was substituted therefor. On February 4, 1793, Mr. Hobart presented a petition from the Catholic Bishops, and introduced it with the following words:—"I also would propose that His Majesty

* See Appendix to First Report, page 53.

might be empowered and authorized to enable the Roman Catholics to endow a College or University and schools" (*Parl. Reg.*, xiii., p. 87). The first real concession made to Catholics was in 1793, when the Relief Bill was passed, enabling them to become Professors in Trinity College, and abolishing subscription to Thirty-nine Articles as a condition of admittance to the University. In the same year Mr. Hobart's scheme was partially carried out in the foundation of Maynooth College, which was intended as a University for laymen as well as for divinity students. Its exclusively Catholic character was not acceptable to Catholic laymen, who presented a petition praying, "in the interest of liberality, that Parliament will not exclude Protestant students from it." The same petition insisted upon the Colleges being autonomous. "As the general end of education is the full and free development of the human faculties and the formation of a virtuous character, the management of it should be as little shackled as possible, inasmuch as experience has ascertained that . . . the improvement of the mind and the extension of science are great only in proportion to their exemption from any external influence or restraint" (*Journ. of C.*, 29th April, pp. 111–12).

As Maynooth was not empowered to give degrees to lay students, this department languished, and was finally absorbed by the ecclesiastical department in 1817.

After the Union little that was practical was done for education until 1831, if we exclude large sums voted for the support of the Kildare-place Society Schools, which though originally founded (in 1814) to carry out the recommendations of the Committee of 1791 (referred to above), were soon suspected of proselytising tendencies, and never throve. But the question of the education of the majority of the population was not allowed to drop. A Commission was appointed in 1807 to inquire into education. It included the Protestant Primate, Protestant Archbishop of Cashel, and Protestant Bishop of Killaloe. Its report, which was presented in 1812, contains the following passage:—"We conceive it to be of essential importance to any new establishment for the education of the lower classes in Ireland, and we venture to express our unanimous opinion that no such plan, however wisely and unexceptionally contrived in other respects, can be carried into effectual execution in this country, unless it be explicitly avowed and clearly understood as its leading principle that no attempt shall be made to influence or disturb the peculiar religious tenets of any sect or description of Christians." No steps were taken to give effect to the recommendations of this Committee, if we except the Kildare-place Society's Schools. In 1825 another Committee was appointed to inquire into the same subject. They recommended as follows:—"That schools should be established for the purpose of giving to children of all religious persuasions such useful instruction as they might severally be capable and desirous of receiving, without having any grounds to apprehend any interference with their respective religious principles."

Both Reports were considered by a Committee of the House of Commons in 1828, who made certain recommendations which were subsequently, to a great extent, embodied in Mr. Stanley's letter of 1831. At this time "mixed education," though unpopular with the Episcopalians and Presbyterians, had strong advocates among the Catholic clergy. On 21st January, 1826, the Archbishops and Bishops of the Roman Catholic Church of Ireland passed, among others, the following resolution:—

> "That the admission of Protestants and Roman Catholics into the same school for the purpose of literary instruction may, under existing circumstances, be allowed, provided sufficient care be taken to protect the religion of Roman Catholic children, and to furnish them with adequate means of religious instruction."—(Memoirs of Sir Thomas Wyse, by Miss Wyse, p. 7.)

These resolutions were signed by Dr. MacHale, who subsequently was the most vigorous opponent of the "mixed system." Some of the Bishops went so far as to express decided approval of undenominational education. The most prominent was Dr. Doyle, who spoke as follows before a Parliamentary Committee on the State of Ireland in 1830:—

> "I do not see how any man, wishing well to the public peace, and who looks to Ireland as his country, can think that peace can ever be permanently established, or the prosperity of the country ever well secured, if children are separated at the commencement of life on account of their religious opinions. I do not know any measure which would prepare the way for a better feeling in Ireland than uniting children at an early age, and bringing them up in the same school, leading them to commune with one another, and to form those little intimacies and friendships which often subsist through life. Children thus united know and love each other, as children brought up together always will; and to separate them is, I think, to destroy some of the finest feelings in the heart of man."—(Miss Wyse, *ib.* p. 10.)

Some of the Bishops had been educated in Protestant schools, and testified they did not think them dangerous to the "faith and morals of Catholics." For instance, Dr. Crolly, who had been educated in a Unitarian school in the North of Ireland, allowed Catholics to go to the Belfast Academical Institution. He gave evidence in 1827:—

> "I never heard attendance of Roman Catholics in this institution was attended with any danger to their faith." . . . "If I had, I should have interfered to prevent it; but I never apprehended, in the slightest degree, anything of the sort."

It must be remembered, however, that this was before Catholic Emancipation created an entirely new state of things in Ireland.

Immediately on the passing of this measure, Catholics interested in education began to take action. Apparently the pioneer was Dr. Bullen, of Cork, subsequently a Professor in the Queen's College. In 1829 he published a pamphlet "for establishing throughout the South of Ireland a system of secular collegiate education." In concert with Sir Thomas Wyse, he prepared a series of measures, especially a Bill for the establishing of a system of National Education, of which the main provisions were embodied in Mr. Stanley's letter of 1831. (*Commission on Queen's University*, 1857, p. 222.) This scheme, which was truncated by Mr. Stanley, is given in full in a letter of Mr. Wyse's to Dr. Doyle (December 11, 1830; Miss Wyse, p. 16), especially in the following passage:—"Our whole national education wants reforming. It is impossible any good—really such—any harmony, any sympathy, can arise from the disjointed elements which actually go under that name. We should have, for the higher departments of Art and Science, a well-arranged system of University Education, subordinate to this, for the great body of the middle classes, the provincial Colleges. Then would come the secondary, normal, or elementary schools in the parishes for the education of the people. All these, if well organised, and well directed, would materially assist, instead of counteracting, each other."

In the same letter, he advocated the establishment of a second University on the ground that Dublin University was, at that time, a "mere ecclesiastical" and "anti-national institution." Religious instruction in the new University "should be left in the hands of the respective clergy who might appoint such time or place for conveying it as they thought proper" (*ib.* p 19). In this last sentence we may discern the origin of the Queen's Colleges scheme.

Mr. Wyse further elaborated his views in a memorandum which he submitted to the Government of Lord Grey on December 9, 1830, in which he enunciated the following principles (Miss Wyse, *ib.*, p. 23):—

> "1. Let Catholics and Protestants be educated, wherever possible, in the same school. . . . Its object is to prepare future subjects for a common country.
>
> "2. Let religious instruction be given regularly to the pupils of each persuasion; but by the persons most competent to give, and most interested in giving, such instruction as ought to be given, that is, by their respective pastors."

In addition to elementary schools, Wyse contemplated the promotion of schools for the middle class. "Let there be established in every province provincial Colleges and academies for the education of the middle classes of society in those departments of knowledge most necessary to such classes."

The provincial Colleges, though not necessarily affiliated to a University, might be made, where deemed advisable, subsidiary to a teaching University, which should not be the Dublin University.

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Such a system, which is still a desideratum in Ireland, Mr. Wyse designated a truly "National System."

Mr. Wyse pressed his views upon Lord Grey throughout the Session of 1831, until September 9th, when Mr. Stanley announced that the Government intended to found a Board to supervise Elementary National Education, and in his celebrated letter to the Duke of Leinster he embodied, without acknowledgment, all Mr. Wyse's proposals so far as they dealt with Elementary Education. The last, and not least important, part of the scheme was shelved.

Stanley's scheme was condemned by the Established Church and Presbyterians as unduly favouring the Catholics, and was, besides, and still remains, merely provisional and temporary in character, although it has lasted for seventy years.

To remedy this defect, Mr. Wyse obtained leave to bring in a Bill on May 19th, 1835, on the ground that a new measure was necessary, as Stanley's scheme was merely provisional, and its annihilation might be the work of a day. This Bill proposed to give effect to the proposals which he had elaborated in his Memorandum to Stanley of 1830.

This Bill, although proposing a gigantic scheme of "mixed education," which might be described as "godless" in the sense the Queen's Colleges scheme was godless, was called an "almost perfect Bill" in the *Evening Freeman*, and secured the approval of many of the Catholic Bishops, including Archbishop MacHale, who "was in raptures" about Mr. Wyse (Miss Wyse, *l.c.* p. 48). It was natural they should approve of it, as they had been consulted about every line of it. "During the whole of the educaticnal movement there was not a single document that he (Dr. Bullen) put forward, nor a bit of evidence he gave, which did not meet with the concurrence of some of the highest dignitaries of the Catholic Church. They attended all our meetings, assented to all our resolutions, and, on the whole, the movement was most united" (Dr. Bullen, *l.c.*, p. 222). But, unfortunately, the Whig Government did not accept Mr. Wyse's Bill, and O'Connell was not complaisant. If Miss Wyse is accurate (p. 48), he "did not wish to promote any comprehensive scheme [illegible] of this description until he could obtain a repeal of the Union." At the same time, a feeling [illegible] tion" was gradually sp[illegible]g adverse to "united educait would appear, to th[illegible]inging up in Ireland, owing, who were not favou[illegible]e influence of the Roman Curia, secular edu[illegible]ably impressed by the results of is exp[illegible]ducation on the Continent. The new spirit evi[illegible]essed, in temperate language, in a passage of [illegible]idence of Dr. Wiseman before the Committee on Diocesan Schools (Q. 6023, p. 37):—

> "I think that in this country and in Ireland such an arrangement could be made that both Protestants and Catholics could attend anything in the form of a University or public school without any harm ensuing; on the contrary, good perhaps might be done. I think, also, that in the lower branches of education, it might easily be managed to give them a common education, reserving the religious education of their respective classes to their own pastors. But with respect to Colleges in which all must board, and must be subject to a certain discipline, I do not see how it is possible to make arrangements that would suit both classes."

The spirit adverse to undenominationalism rapidly gained strength during the papacy of Gregory XVI., to such an extent that the Propaganda had all but decided upon proclaiming its disapproval of "mixed education" even in elementary schools. Archbishop Murray, a member of the National Board, addressed a letter to the Pope asking that a legate should examine the system before it was condemned. Some ecclesiastics of the lower grade were sent to Rome to give information. The result was that Bishops were allowed, each in his own diocese, to accept or reject, as they might judge best, the National system. (*Life of Archbishop Murray, by Father Meagher*, p. 61.)

From the failure of Mr. Wyse's Bill to July 19th, 1844, no further steps were taken to improve education in Ireland, if we except the strong pronouncement of the Committee of the House of Commons in 1838:—

> "It is unwise, dangerous, and pernicious to the social condition of the country and to its future tranquillity, that so much encouragement should be given to the education of the lowest classes, without at the same time due provision being made for the education of the middle and upper classes." "Elementary education has succeeded, and religious differences are melting away." This fact is "sufficient to justify the Government laying down the same principles in the foundation of all other systems."

On July 19th, 1844, Mr. Wyse proposed an important motion, to which the Queen's Colleges scheme of 1845 was really due. It is to be found in *Hansard*, of that date, p. 1122:—

> "The importance of due provision being made for University Education of Her Majesty's Roman Catholic subjects in Ireland, especially of such as are intended for the priesthood"—(this was before Peel's Maynooth Bill)—"and the inadequacy of the means and system now existing for the attainment of such an object," and proposed "that steps should be taken by an enlargement and improvement of existing arrangements, either by opening the emoluments and honours as students of the University of Dublin to Roman Catholics as well as Protestants, and raising the College of Maynooth to the dignity of a theological faculty of the said University, or by founding and maintaining a Roman Catholic University with equal rank, endowments, and privileges with those of the University of Dublin, or by some other means adequately to supply the deficiencies now complained of, and, as far as may be effectually, to provide for the future moral and intellectual wants of the Roman Catholic inhabitants, thus promoting the advancement and happiness, not of the Roman Catholics only, but of all classes and persuasions of the Irish people."

He proposed that there should be three Colleges in the University of Dublin—Belfast, Maynooth, and Trinity College.

In reply to Mr. Wyse, Sir R. Peel (*Hansard, ib.*, p. 1131) promised to consider his proposals, and said, "I trust that we shall, at an early period next Session, propose means for increasing academic education, or we shall [illegible]notify to the hon. gentleman that our efforts have been unsuccessful, and that we must leave him to bring on his plan."

Sir R. Peel's promise was redeemed on May 9th, 1845, when Sir J. Graham introduced the Bill "to enable Her Majesty to endow new Colleges for the advancement of learning in Ireland."

In the speech in which he introduced the measure, Sir J. Graham laid down as the principle on which the Colleges would be founded "the absence of all interference, positive or negative, with the conscientious scruples of the students in matters of religion." There would be no Faculty of Theology in the Colleges; but

> "It must not be supposed that religion will be altogether disregarded in this institution. On the contrary, we propose that under this Bill every facility shall be given for the endowment, by means of private benefactions, of Professorships of Theology, subject to the visitorial power of the Crown, and, under regulations as to the lectures to be given in the Colleges, we propose that instruction in Theology may be given in the lecture-rooms within the walls of the Colleges. It would be monstrous if any other course were taken; for, although in localities like Cork and Galway the Colleges must necessarily be in the main Roman Catholic Colleges, I yet hope the Protestant youth of that neighbourhood will attend, and share the advantages of the education in Arts and Science there provided." (*Hansard*, vol. 80, page 356.)

Sir James Graham did not propose to connect the provincial Colleges with a central University at once, but held out the hope that, when Parliament should see the result of the experiment, a University should be founded (*ib.* p. 364). This central body should not be the Dublin University.

> "Neither policy, nor equity, nor justice will admit of any interference with Trinity College as it is now founded, and as it now exists. That College is an entirely Protestant foundation" (*ib.* p. 360).
>
> "Trinity College is so interwoven and blended by use and long possession with the University of Dublin that, even if it were found to be expedient to dissever them, it would be difficult, if not dangerous, (*ib.* 361).

The measure introduced by Sir James Graham was received with general favour, even by the Irish members; but the voice of criticism was not stilled. Mr.

Sheil (*Hansard*, vol. 80, p. 381) objected to the teaching of religion being left "to the contingency of private benefactions." "This imperfection might be fatal." "It should be imperative on every student to attend some place of religious worship." "The Catholic Bishops should be consulted." "Trinity College should be opened."

The principle of non-interference with the religion of the students was generally approved. Mr. M. J. O'Connell went so far as to hope that the College in Galway would not be purely Roman Catholic, nor Belfast wholly Presbyterian (*ib.* p. 397). Mr. Wyse, to whom the scheme in its main provisions was due (see Sir J. Graham, *Hans.*, vol. 80, p. 365), expressed his gratitude for the measure, but made some important criticisms, which led subsequently to some amendments.

(1.) He thought the Professors of Metaphysics and History should be approved of by the Bishops of the dioceses (*ib.* p. 368).

(2.) There should be *conservatoria*, or boarding-houses, whose heads should receive the approval of the religious superiors of the different classes.

(3.) He was opposed to the appointment of Professors by the Crown, as "suspicion would at once be excited that the Colleges were only Government establishments."

(4.) A more industrial character should be imprinted on the education given in the Queen's Colleges. With this view he proposed that a College near Dublin should be founded, not in opposition to Trinity College, but on the ground that Dublin should have the advantages of industrial education.

"So long as Trinity College was solely Protestant he did not think that there should exist in the same city another University, and if two such establishments were to be placed face to face, there would be a *risk* that such an arrangement, instead of producing harmony, would be productive of division."

Sir R. Inglis's speech (*Hansard*, vol. 80, p. 378) is important only as containing the phrase, upon which so many changes have been rung, viz., the Queen's Colleges' scheme "is a gigantic scheme of godless education."

Lord Palmerston (*ib.* p. 406) opposed Mr. Wyse's proposal about alternative Professors in the "dangerous subjects":—

"Would you have Professors of both religions? That would not carry out the object of the endowment, which is to cement the harmony beween both sections." "It would only lead to a civil war of theological doctrines in these Colleges, where you mean to lay the foundations of religious peace."

He advocated the opening of Dublin University:—

"It will be necessary to establish some central point, probably in connection with Trinity College, Dublin, which will combine these different Colleges into one University, and will, if possible, connect Trinity College with it as a component part" (*ib.* p. 408).

Sir R. Peel (*Hansard, ib.* p. 385) replied to his objectors:—

"It would have been impossible to consult the Catholic Bishops without consulting the prelates of the Established Church. If we had done this, it would have been utterly impossible to establish any scheme of academical education."

He was opposed to the proposal of having alternative Professors of Theology appointed and paid by the State (*ib.* p. 388), and of making religious instruction compulsory:—

"My firm belief is, that you have a better security for religious instruction in the sense of duty and obligation on the part of the parents of the youth, than in any system of compulsion that you can devise" (*ib.* p. 391).

The reception which Sir R. Peel's measure met in Ireland is narrated in Most Rev. Dr. Walsh's work, "The Irish University Question" (p. 401, *seq.*). (1) It was condemned as "godless" by O'Connell on May 12th, at a meeting of the Repeal Association, and in *Freeman's Journal* of 13th May. But it should not be forgotten that the laity were by no means unanimous. The Young Ireland party (especially Thomas Davis, Dillon, and Duffy) strongly supported it (see "My Life in Two Hemispheres," by Sir C. Gavan Duffy, vol. i. p. 107, quoted in Miss Wyse's pamphlet, p. 98).

"When the new proposal was mentioned in the General Committee (of the Repeal Association) there was universal congratulation, till John O'Connell entered and declared it was an abominable attempt to undermine religion and morality in Ireland." . . . "At the next meeting of the Association he (Daniel O'Connell) and his son assailed the Bill without stint, and Davis and Dillon defended it. Next day a requisition was privately presented to O'Connell, asking that the subject might be mentioned no more till the Catholic Bishops, who were about to hold a conference on the Bill, should have spoken. As the requisition was signed by forty members of the General Committee, including all the barristers and country gentlemen, and, indeed, every man of education outside the O'Connell family, he thought fit to consent."

(2) "On 21st May the Bishops met in Dublin, and condemned the scheme as 'dangerous to the faith and morals' of Catholic youth."

This special meeting of the Bishops was summoned by the Catholic Primate of Ireland, Most Rev. Archbishop Crolly, who at first considered the scheme dangerous. He explained his position in a speech delivered in August, 1845.

"When the scheme for establishing the provincial Colleges first made its appearance, I entertained serious apprehensions respecting the morality of the students, who appeared to be left without any moral superintendence, subject to their own inclinations and propensities, at a period of life the most critical, when the passions are most violent and dangerous. Under that impression, I called a meeting of the Catholic prelates who were willing and ready to co-operate on fair and reasonable terms with the Government. We discussed the provisions of the Bill, and, after mature deliberation, we went to the Lord Lieutenant, and represented our objections and the amendments we deemed advisable. The Lord Lieutenant received the memorial, and forwarded the state of the case to the Government, who made such amendments as were calculated to afford general satisfaction. By the Bill as it stands at present, no pupil could be received into any of the new Colleges, unless he would lodge with his parents, a relative, a guardian, or in a house fully licensed by the President of the College, for the very purpose of protecting his morality. Besides, the Bill gives full power to have chaplains of every religious persuasion duly appointed for the purpose of superintending the moral conduct of the students, and giving them proper moral instruction at such hours as will not interfere with their scientific studies. This being the most important point in the measure, and one to which most objections were urged at the outset, I am determined, as far as I am concerned, to give our provincial Colleges a fair trial."—(*Statement of Committee of Convocation of Queen's University*, 1873, p. 10.)

The amendments suggested by the Bishops are as follows:—

(1.) "That a fair proportion of the Professors and other office-bearers should be members of the Roman Catholic Church, whose moral conduct shall have been properly certified by testimonials of character, signed by their respective prelates. And that all the office-bearers in those Colleges should be appointed by a Board of Trustees, of which the Roman Catholic prelates of the provinces in which one of these Colleges should be erected shall be members."

(2.) "That the Roman Catholic pupils could not attend the lectures on History, Logic, Metaphysics, Moral Philosophy, Geology, or Anatomy, without exposing their faith or morals to imminent danger, unless a Roman Catholic Professor be appointed for each of those subjects."

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(3.) "That if any President, Vice-President, Professor, or office-bearer in any of the new Colleges be convicted before the Board of Trustees of attempting to undermine the faith or injure the morals of any student in these institutions, he shall be immediately removed from his office by the same Board."

(4.) "That, as it is not contemplated that the students shall be provided with lodgings in the new Colleges, there shall be a Roman Catholic chaplain to superintend the moral and religious teaching of the Roman Catholic students belonging to each of these Colleges; that the appointment of each chaplain, with a suitable salary, shall be made on the recommendation of the Roman Catholic Bishop of the diocese in which the College is situate; and that the same prelate shall have full power and authority to remove such Roman Catholic chaplain from his situation." (*Irish University Education*, J. P. Pye, p. 9.)

The memorial of the Bishops was considered by the Government before the Bill came on for second reading on May 30th, and Sir J. Graham announced that "the adoption of the most material facts in that memorial would be inconsistent with their duty and with the principle of the Bill." Still, before the measure went into Committee, the Government consented to important amendments:—

(1.) "The Government promised to take the utmost care in selecting proper persons for those institutions which are to be established in the Roman Catholic provinces of Munster and Connaught (Sir R. Peel, *Hansard*, vol. 80, p. 1289), but was unwilling to tie down the discrimination of the Crown by an enactment." . . . "I consider that true conciliation and concert and co-operation are more likely to arise from the free action of the Executive Government in a friendly spirit than from the introduction into laws of this kind of an enactment which leaves nothing for the discrimination of the Government" (*ib.* vol. 82, p. 366–7).

(2.) The Government refused to accept the proposal that there should be alternative Professorships of History, Logic, Metaphysics, Moral Philosophy, Geology, and Anatomy, on the ground that such a policy would introduce a spirit of strife into the College; although, as regards Th[illegible] Mr. Wyse pointed out that:—

"At Bonn, in the gymnasium, for instance, Catholics and Protestants are found constantly side by side. Their religious instruction is minute and ample. . . . It is given regularly to each persuasion by their respective teachers under the same roof, but apart. No evil seems to result from this arrangement; it leads neither to religious discord nor to religious indifference. Each adheres to his own faith, but respects that of others." (Miss Wyse, *l.c.*, p. 60.)

Mr. Wyse desired Catholic and Protestant Professors of Metaphysics, Moral Philosophy, and Philosophy of History, but not of Anatomy and Geology.

(3.) Mr. Wyse had urged upon the Government "that the point was to attain such a governing body as could and would dismiss Professors if circumstances required." . . . "He thought upon this point alone depended the whole character for good or evil of the proposed system." (*Hansard*, vol. 80, p. 1273.)

The Government proposed certain *ex-officio* members of the Board of Visitors, who should represent the different religions, viz., in Belfast, the Established Church Bishop, the Roman Catholic Bishop, an eminent Presbyterian clergyman; in Galway and Cork, the Established Church and Roman Catholic Bishops.

The Government proposed that the power to dismiss a Professor should be vested in the Crown, which should take action on the report of the President and Council of the College (see Statutes of Queen's College, Galway, chapter V.).

O'Connell declared the Bishops were not satisfied with this provision—"I mean you no disrespect, but I will not take your word for it (viz., that Professors would be dismissed if preachers of infidelity)." . . . "The Bishops insist on having a power lodged in them for finding out the infidelity, and of having some voice, at least, in the dismissal of the Professors who might inculcate it." "They say, 'We won't run the risk.'"—(*Hansard*, vol. 81, p. 1090.)

(4.) Although the students were not provided with lodging in the Colleges, the provision for moral control was, in the opinion of the Government, perfect. The Government offered encouragement for the erection of halls (see Queen's College Act, XVII. and XVIII.), the power of appointing principals of these halls to be vested in the Visitors. No rule with regard to their guidance and administration should be carried into effect without the consent of the Visitors. In addition to the halls, there should be licensed lodging-houses, whose licenses should be renewed yearly (Queen's Colleges Act, XVI.). The Government consented that chaplains or deans of residence should be appointed by the different denominations. As to the question of salary of these chaplains, the Government refused to yield, as they preferred to leave religious training to voluntary effort.

(5.) As to the appointment of Professors by the Crown, the Government were urged by Lord John Russell to abandon their policy—"All depends on choosing your Professors in a different way," and also by Mr. Wyse.

Sir J. Graham stated that the Professors would be appointed by the Crown, "to provide security" in the absence of tests; but he thought the question might be reconsidered after 1848 (*Hansard*, vol. 81, p. 1041). "If a University shall be established, it will be a natural arrangement that the governing body shall have the power of recommending to the Crown, as various Professorships in the Colleges shall become vacant, those whom, after examination or otherwise, they shall deem best fit to fill the Chairs, preserving always the Crown veto." Mr. Smith O'Brien proposed a Board, with a majority of Roman Catholics, empowered to recommend persons who should be appointed to Professorships. The Government nominated such a Board, on which the various religions were represented, before the end of this year, but the project fell through, as the Catholic prelates declined to assist.

Mr. O'Brien went on to say:—

"He did not believe that the system of appointing Professors would be altered by Parliament. It was only necessary for the Government not to bring forward any measure on the subject to ensure the continuance of the power in their own hands." (*Hansard*, vol. 81, p. 1350.)

The Government amended the Act (s. x.) as follows:—"The power of appointing the Professors shall be vested in Her Majesty, her heirs and successors, until the end of the year 1848, and afterwards as shall otherwise be provided by Parliament, or in default of any provision to the contrary, in Her Majesty, her heirs and successors." But Mr. S. O'Brien's prophecy has proved true to the present day.

On the second reading of the Colleges Bill, the largest portion of the speeches of the Government was devoted to replying to Sir R. Inglis's taunt that they were setting up a "godless" system of education. This phrase had been caught up by O'Connell and the Catholic prelates, and the opposition to the Bill was mainly based on this—according to the Government—misconception.

Sir R. Peel (*Hansard*, vol. 80, 1283) admitted that the system which the Government proposed was not applicable to England or Scotland, and further said:—

"I concur with Lord J. Russell that, if I can have nothing but improved secular instruction, I would rather have that than ignorance, but certainly I should feel that pure secular instruction, without any provision for religious instruction, was but a partial and imperfect training. If the Government had proposed an alternative plan, Sir R. Inglis would have said, 'this is a covert mode of providing endowment for the Roman Catholic Church. . . . I charge you with an utter and manifest indifference to all religions; for whether they be Roman Catholics, or Presbyterians or members of Established Church

here they have Professors of Metaphysics and Moral Philosophy and Divinity, and are all put upon a footing,' . . . But do I endanger 'faith and morals' by inviting Roman Catholics and Protestants to make provision for the education of their youth."

Again, Sir J. Graham (*Hansard*, vol. 81, p. 1355) maintained—

"It is not true that religion is excluded." "The Government contemplate the foundation of halls in which religious instruction would be imparted, and Visitors would be appointed by the Government in whom the people of Ireland would put confidence."

"The Bill had been altered in consequence of the memorial of the Roman Catholic Bishops to the Lord Lieutenant, but he did not think it the duty of Parliament to resign to any ecclesiastical authority their discretion in a matter so proper to their functions as that of the secular education of the Irish people." . . . "The principle of the Bill was that all religious instruction should be voluntary." . . . "So far from discouraging religious education, they had supplied every inducement to provide religious instruction out of the walls of the College, and within the walls they had afforded facilities for giving such instruction" (*ib.*, vol. 82, p. 112). (See Colleges Act, xiv.)

Again, Sir R. Peel said (*Hans.*, vol. 82, p. 371):—

"The principle of equality is preserved in the new institution. We have given the Catholics every facility for religious instruction. We have given them direct sanction and encouragement. We have admitted that secular instruction will be imperfect unless accompanied by religious instruction as its basis; but we have thought (it may be erroneously) that the best way of providing that religious instruction, where there is so much jealousy of interference, was to give every facility, but to call on parents . . to provide the means, and to call on the respective Churches to give their aid in providing that education."

The speeches of Lord J. Russell during this debate are of importance in view of the fact that from 1846 he was Prime Minister, and was entrusted with the establishment of the Colleges and the appointment of the Professors. His disapproval of the measure was unqualified. He failed to see why the Government should not agree to some kind of proposal which should be in accordance with the Roman Catholic clergy. He thought the Roman Catholic clergy should be recognised as "part of the plan," and have power to make regulations as to attendance at religious observances. (*Hans.*, vol. 80, p. 1247.) The Government should consult Archbishop Murray, "a man no less distinguished for his moderation of opinion and his loyalty to the throne, than he is by his unswerving fidelity to his own Church" (*ib.*, p. 1248). He hoped before the Bill went into Committee, the Government would inform the House they had the assent of the clergy generally. He thought that if the Bill, on leaving the Committee, was condemned by the Bishops, it was better not to send it to Ireland at all (*ib.*, vol. 81, p. 1359). He was prepared to vote for religious instruction for Roman Catholics (*ib.*, p. 1362). "Either Trinity College should be thrown open, or religious instruction provided for the Roman Catholic youth of Ireland." He refused to admit that the Roman Catholics secured equality with Protestants in the matter of education by means of this measure:—

"For Roman Catholics you established a certain number of Colleges suitable for the middle class, which are open to all, and at which persons intending to devote themselves to commercial pursuits, to civil engineering, and professions of a similar nature, may obtain a good education; but with respect to a higher kind of education you found that that is solely to be obtained in the University of Dublin, and that that University of Dublin is presided over by a body which is exclusively Protestant" (*ib.*, vol. 82, p. 375).

Equality may be secured in two ways:—

(1.) By founding a separate institution for Roman Catholics, with as rich an endowment as Trinity College possesses; or

(2.) By opening Trinity College (*ib.*).

The amendments in the Bill introduced by the Government failed to satisfy the majority of the Catholic hierarchy. Archbishop Crolly, it is true, recognised the amendments as adequate (as was stated above), and was supported in this opinion by Dr. Murphy, of Cork, Dr. Murray, Archbishop of Dublin, Dr. Ryan of Limerick, and five other Bishops (Miss Wyse, *l.c.*, p. 76); but the majority, led by Archbishop MacHale, would have none of the measure. His Grace wrote to O'Connell, on June 26th, 1845:—

"The resolution of the Bishops regarding this bad scheme of academic education remains in full force, and no Ministry can ever hope to render tolerable to Catholic people in Ireland so penal and revolting a measure." (Quoted in *Hansard*, vol. 81, p. 1356.)

The Archbishop also wrote to Peel:—"Disguise it as you may, your scheme of academical instruction, coupled with your repudiation of the resolutions and memorial of the Bishops, is only a fresh attempt, similar to that of the Church schools, to bribe Catholic youth into an abandonment of their religion. And you do this to second the schemes of mercenary infidels, who are springing up in the country, and who, under the affectation of zeal for education, would not hesitate to advocate Mahometanism, if it gave them access to the patronage of the Lords of the Treasury." (*Ib.*, vol. 81, p. 1087.)

On the other hand, the Presbyterians were not satisfied with the concessions of the Government. Peel (*Hansard*, vol. 81, p. 1087) quoted from a letter he received from a Presbyterian gentleman:—

"Sir J. Graham appears to have intimated that all religions would be represented in the Professorships. Now, I should be acting most unfaithfully to the Government, did I not clearly express my conviction that one Roman Catholic or Unitarian Professor in the undergraduate course would at once decide the General Assembly to withdraw every student. Of this result I entertain not a single doubt. You might, indeed, appoint an Episcopalian not known as a Puseyite as readily as a Presbyterian or a Baptist, Independent or Methodist, without much dissatisfaction, but not a Unitarian or Roman Catholic Professor."

The Catholic prelates met again on 20th September, 1845, and twenty out of twenty-six reiterated their condemnation of the measure; and again on 18th November, 1845, when they unanimously referred the question to the Holy See. Pending this decision, the Bishops favourable to the scheme held their hands. In 1845 the Government nominated a Board of Catholics and Protestants to select Professors. Archbishop Murray was named as a member, but he publicly proclaimed his inability "to accept such an office, useful as it might seem, until I should learn what determination the Holy See, to which the matter had been referred, would adopt upon the whole affair" (*Life*, p. 202). Meanwhile, "having weighed with all the judgment I possessed the peculiar circumstances of this country, and having conferred with other ecclesiastics, whom I deemed most eminent for piety and wisdom, I arrived at the full persuasion that, for the protection and preservation of our holy religion, it was safer far to tolerate these Colleges, though not unattended with danger, and allow our priests, aided with proper precautions, to watch over their progress, than to repudiate them utterly." (*Ibidem.*)

On 9th October, 1847, a Rescript was issued from Rome that the Queen's Colleges involved "a grave danger to the faith of Catholics." On 11th October, 1848, the danger was described in another Rescript as "intrinsic."

And on April 18th, 1850, another Rescript was issued, forbidding priests to accept appointments to positions of influence in the administration of the Colleges of Cork and Galway. (Dr. Walsh, *l.c.*, p. 405.)

With reference to these Rescripts it is important to give in full some letters of Archbishop Murray written on the subject.

LONDON.

Dec. 19, 1901.

Dr. W. J. M. Starkie.

(1.) To the *Tablet*, 11th February, 1850.

"Mountjoy-square, 11th February, 1850.

"DEAR SIR,—I regret exceedingly to perceive that you seem, in one of your late articles, to attribute to me an opinion that no Catholic student could, under any circumstance, attend without sin the lectures to be given in the newly-established Queen's Colleges. If this was really your meaning, I beg to assure you that I have never uttered a word to indicate that such is my opinion. The mistake into which you seem to have been unintentionally led appears to have arisen from a supposition of mine, perhaps a very unfounded one, that the Sacred Congregation of the Propaganda was impressed with a notion of that kind when the Rescript regarding the Colleges was issued, and when it was not, of course, accurately acquainted with the various checks against irreligion and immorality which were then in preparation. That such an idea should have been then entertained would, perhaps, under these circumstances, be hardly surprising; but the supposition that it really was so is, at least, premature, for on receiving the two Rescripts, of which there is question, I cannot discover in either of them any declaration to that effect, and it is neither my duty nor my wish to make any addition to them.

"The Sacred Congregation—always prudent, always dignified—gives no countenance in these documents to the absurdity of applying the epithet of 'godless' to institutions which comprise the ministers of religion, and appointed for the express purpose of teaching the students to adore, and love, and serve God. It calmly expresses its doubts as to how far the proposed checks against irreligion would be sustained by the laws of these realms, which it professes not to understand; it indicates other grounds of fear, which lead it to apprehend that the new Colleges would not be sufficiently safe for the general education of Catholic youths; and it therefore enjoins the Catholic Bishops to take no part in the execution of the law in virtue of which they were to be established. I do not find any other distinct prohibition in those Rescripts. With this injunction I at once pledged myself to the Holy See that I would strictly conform. But I stop there. Being thus wholly unconnected with those institutions, it is not for me to anticipate any future declarations regarding them which may emanate from the wisdom of the same supreme authority, nor to dictate, in the meantime, to others what conclusions respecting individual cases they ought to draw from the two important documents which are now before them.

"Having given this explanation, I must beg to decline entering again, through the newspapers, upon this subject.

"I have the honour to remain, dear Sir,

"Your obedient Servant,

✠ "D. MURRAY."

NOTE.—*Reprinted from the Galway Vindicator of 13th February*, 1850.

"Rosemount, Roebuck, 30th September, 1850.

"MY DEAR LORD,—May I respectfully ask your Grace, as well for my own information as for that of some other Roman Catholics of your diocese, who have sons either in Trinity College or in course of preparation for it, or for the newly-established Queen's Colleges, how are we to understand the late Synodical Address on the subject of these Colleges? Are we thereby actually prohibited from sending our children to these Colleges?—and if so, how far is such a prohibition actually binding on us, *in foro conscientiæ?* To many of us it appears altogether inexplicable, that after petitioning, in the days of persecution, for admission into Trinity College—after being permitted, with the tacit sanction of your Grace and your eminent predecessors and colleagues in the Church of Ireland for upwards of half a century, to receive our education there—and seeing that one of the members of that very Synod, most distinguished for rank, is actually a graduate of the University, it does appear strange that, in the year 1850, education in Trinity College, or even in any of the Colleges recently established on such a liberal footing as regards us, should be unequivocally condemned; and that without one reason being assigned for this sudden change, or any provision in the meantime being made for affording a suitable education to our children. I need not say that this subject is one of intense interest to the Roman Catholic gentry of your Grace's diocese, as well as to the Roman Catholic middle classes of Ireland generally; and I, therefore, my dear Lord, take the liberty of entreating such an answer from your Grace as I may make known to the numerous persons who have spoken to me upon it; and which, if it do not calm our apprehensions, at least may guide our future course of action on this all-important point.—I am, my dear Lord, with the sincerest respect and affection,

"Your Grace's obedient Servant,

"JOHN R. CORBALLIS.

"The Most Rev. Archbishop Murray."

REPLY OF ARCHBISHOP MURRAY.

"Mountjoy-square, 1st October, 1850.

"MY DEAR FRIEND,—I have received your interesting letter, and I need not, I hope, assure you that I participate fully in the deep anxiety which you so justly feel; but I must pray you not to press me to enter, at this moment, into details on the painful subject to which you allude. I may, however, mention that a petition, signed by thirteen Bishops, has probably ere this reached Rome, supplicating our most Holy Father Pius IX. to refuse his sanction to certain proposals on points yet undecided relative to the subject of academical education. To the decision to be given thereon, whatever it may be (though I still venture to hope that it will be favourable to the petitioners), those prelates will be found among the first to reverently submit; but in the meantime I am not aware that there is amongst them one who would wish to extend the provisions of the Pontifical Rescripts already issued on that subject beyond the strict letter of what the Holy See has prescribed.—I have the honour to remain, my dear Friend,

"Yours most faithfully,

✠ "D. MURRAY."

"J. R. Corballis, Esq."

NOTE.—*Reprinted from the Galway Vindicator of 2nd October*, 1850.

It may be mentioned that the last letter was written subsequently to the Synod of Thurles, which condemned the Colleges, and forbade any ecclesiastic to have anything to do with them. The petition referred to in the Archbishop's last letter, as it is believed, was to supplicate Pope Pius IX. not to ratify the decree of the Synod, forbidding priests, under canonical censures, to interfere in the administration of the Colleges. It was this decree, and not the pronouncement that the Colleges were "dangerous," that was fatal to the success of the new Colleges.

The Queen's Colleges Act became law in July, 1845. The three Presidents and the three Vice-Presidents of the Colleges were appointed in the beginning of 1846. They were immediately called together by Lord Heytesbury, who gave them instructions "to give their best consideration to the question how far the plan of education in their respective faculties may be most suitably and most completely carried out." (*Queen's College Com.*, 1857, p. 315.)

The Presidents and Vice-Presidents frequently met and framed a code of regulations, which they submitted to the Lord Lieutenant. But, before anything final was done, Sir R. Peel resigned office (June 29, 1846), and Lord Bessborough succeeded Lord Heytesbury as Viceroy in the Government of Lord John Russell. It was stated in evidence before the Queen's College Commission, in 1884, by Professor Lewis, of Cork, who was appointed in 1849, that Lord J. Russell was anxious to shelve the Queen's College scheme, and postponed opening the Colleges. It is certain that he expressed his disapproval of Peel's scheme during the debates in 1845, and for the first year of his tenure of office no-

thing was done to carry out Peel's intentions. The Presidents and Vice-Presidents were never summoned during the viceroyalty of the Earl of Bessborough, and the code of regulations which they had sent to the Castle was lost. When Lord Clarendon succeeded, on Lord Bessborough's death (June, 1847), he summoned the Presidents together, and directed them to commence *de novo*. (*Queen's College Commission*, 1857, p. 124.) Lord Clarendon "was animated" at this time "by an earnest desire and hope to conciliate the Irish Catholic body." (*Greville Memoirs*, vol. vi., p. 199, Silver Library Edition.) He found that Peel had appointed a priest as President of Queen's College, Galway (Father Kirwan), and Sir R. Kane, a distinguished Catholic layman, President of Queen's College, Cork. Being anxious to carry out the same policy, he had conferences with the Catholic Bishops, and held out hopes to them that although the appointment of Professors could not be vested in them the Government would consult their wishes.

On 19th March, 1848, he wrote to Dr. Murray:—

"Moreover, in the Council, Professorships, and other posts of each College, the Catholic religion will be fully and appropriately represented, for these Colleges are institutions for the education of the middle classes, and the Government would fail in its object of training up the youth of Ireland to be good men and loyal subjects if their religious instruction and moral conduct were not duly provided for, and guarded by every precaution that the most anxious solicitude can devise." (W. K. Sullivan, "University Education in Ireland," p. 18.) . . . "He also submitted the new statutes to the heads of the different Churches and Bishops, who expressed generally satisfaction with them." (P. S. Henry, *Queen's College Commission*, 1857, p. 60, *seq.*)

But the majority of the Catholic Bishops seem to have felt no confidence in his assurances. The Colleges were pronounced "dangerous to faith and morals" in Papal Rescripts of 1847 and 1848, and the Sacred Congregation (in 1847) urged the Bishops to erect a Catholic University, "on the model of that which has been founded in Louvain by the prelates of Belgium." The attitude of the Bishops, and the experience of a year of office during the crisis of the Famine, seem to have disheartened the Lord Lieutenant, and convinced him that "no reliance at all could be placed on the loyalty of the Catholic population and its chiefs," and that, in fact, the Protestants alone were to be depended upon for attachment to the British connexion (*Greville Memoirs*, vol. vi., p. 200). At any rate from this time he ceased to consult the Bishops. Dr Kirwan of Galway died, and he appointed Mr. Berwick, a Protestant, to succeed him, and the important question of the selection of Professors he referred to the Council of Presidents and Vice-Presidents, which contained only two Catholics out of six (Sir R. Kane, *Queen's College Commission*, 1857, p. 147).

The recommendations of this Council were, unfortunately, out of harmony with the promises of Lord Clarendon to Dr. Murray (quoted above). Of twenty Professors appointed to Queen's College, Belfast, two were Roman Catholics (Professors of Geology and Celtic Languages). Of twenty Professors appointed to Queen's College, Cork, three were Roman Catholics (two in Medicine, one in Law). Of twenty Professors appointed to Galway, two Roman Catholics were appointed to the Faculty of Arts (Mathematics, History, and English Literature). It has been stated by Dr. Sullivan *loc. cit.*) that the Queen's Colleges were finally condemned mainly on account of the constitution of the staff, and Father Delany has recently said the same. It is not for a layman to express an opinion, but one may quote the words of an Irish Member of Parliament (Mr. O'Flaherty, Cp. *Hansard*, vol. 107, p. 354)—"The success of the Colleges depends entirely upon the appointment of the Professors." If one may believe Greville (*Memoirs*, vol. vi., p. 111) the *Curia* might have been conciliated.

"A few days ago I met Dr. Wiseman, and had much talk with him about Rome, and the Pope's recent Rescript about the Colleges in Ireland. He said it was all owing to there being no English Ambassador at Rome, and no representation of the moderate Irish clergy. Irish ecclesiastical affairs were managed by MacHale through Franzoni, head of the Propaganda, and Fr. Ventura, who has the Pope's ear, and he strongly advised that Murray and his party should send an agent to Rome. . . . He talked a great deal about the Pope, who, he said, had not time to inquire into these things himself, and took his inspirations from the above-named personages. . . . He thinks the Rescript may be early got rid of by a little management."

To like effect spoke an Irish Member of Parliament (Mr. Power, Cp. *Hansard*, vol. 107, p. 359)—"The Pope's condemnation of the Colleges was founded rather on the fears of certain parties in Ireland than on any knowledge he had of the state of things."

Although pronounced "dangerous," the Colleges were not finally condemned until August, 1850, when the Synod of Thurles decided by a majority of one—(Cp. W. K. Sullivan, *l.c.*, p. 52)—"to prohibit *under Canonical Censures*, every ecclesiastic from having any official connection with them."

This decision was opposed by Dr. Murray, and, it is believed, representations were made to Rome by the minority of the Bishops that this resolution should not be affirmed. Dr. Murray believed that the Pope would refuse to ratify it. But the "Durham Letter" of Lord John Russell (November 10th, 1850), and the anti-Papal agitation, which culminated in the Ecclesiastical Titles Bill, were regarded as "so insulting at Rome, and such a proof of the hostility of the British Government to the Roman Catholic religion," that the negotiations came to an abrupt termination (*Greville Memoirs*, vol. vi., p. 376); and the famous Rescript of 23rd May, 1851, gave a fatal blow to the Colleges. Up to this time many ecclesiastics of high position were nominally connected with them, although they refused to act until a final decision had been given by Rome. Archbishop Cullen and Dr. Denvir were Visitors of Belfast Queen's College; Archbishop Slattery and Dr. Delaney of Cork Queen's College; Archbishop MacHale and Dr. O'Donnell were appointed visitors of Galway Queen's College; but all declined to act. Father O'Toole, Professor of History, Galway, resigned. Rev. William O'Connor, Rev. Mr. Mitchell, Catholic Deans of Residence, in Cork and Galway respectively, threw up their offices. These appointments had been made in compliance with the unanimous request of the Roman Catholic prelates (*Queen's Colleges Commission*, 1857, p. 248).

It will thus be seen that "no institutions were ever yet opened under such unfavourable circumstances." (Berwick, *Queen's Colleges Commission*, 1857, p. 244.) They received little support, "even from the Government who founded them" (Kane, *ib.* p. 135), and Lord John Russell's Government were suspected of a design not to proceed with the scheme. On July 13, 1849, Mr. Plumptre asked whether Lord John Russell intended to persist in their establishment, as a protest, signed by a large portion of the Catholic hierarchy, had been received, and seeing they were objected to by a large portion of the English people. Lord John Russell, in reply, said the Government could not assent to the Bishops having a *veto* on certain appointments, as they claimed. "Both the former and present Government gave explanations that satisfied a great number of the Catholic Bishops that education might go on in the Colleges with perfect security to the religious opinions of the Roman Catholic youth. The plan of the Colleges was a thing which did not immediately concern the present Government."

But the intentions of the Government were suspected in view of their declaration in favour of sectarian education in 1845. Sir Robert Kane said, in 1857 (*Queen's Colleges Commission*, p. 136), "I believe nothing has been more fatal to the progress of the Colleges, and nothing has affected our numbers more, than the general impression which has been felt that united education is not to be permanently maintained, and, therefore, persons have been afraid of exhibiting themselves as approving or devoted to it, lest such approval or devotion might compromise them in the future condition of affairs, when exclusive sectarian education would be adopted."

The resignation of the Deans of Residence went far to make the Queen's Colleges really "godless," at least

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for Catholics. When the Bill was introduced there was no idea of having these officers. Their creation was "a sort of compromise between the extreme secularists on the one hand, and the parties who wished to introduce the religious element on the other hand (Kane, ib., p. 128).

For more than a year, Fr. O'Connor, Dean of Residence in Cork, used to deliver a lecture every Saturday on moral and religious subjects to the young men under his charge. Sir R. Kane said (*ib.*, p. 127):—"I have heard some of the parochial clergymen in the town say that they considered the young men of the College who had the advantage of a Dean of Residence to be superior as a class, in their moral and religious habits, to any similar class of young men in the locality."

Students under twenty-one who resided in licensed boarding-houses, were compelled to attend these lectures. (*Queen's Colleges Commission*, 1857, p. 45.)

The Dean also visited the lodging-houses, and ascertained from the matron whether the students went to church.

After May 23rd, 1851, the Government desisted from all attempts to conciliate the Catholic prelates. Their only anxiety was not "to re-open the education question" (Sir R. Kane, *Queen's Colleges Commission*, p. 126). The situation was, indeed, hopeless, unless the Government abandoned the principle on which the Colleges were founded. The views of the Roman Catholic hierarchy on the dangers of "united education," even in secular subjects, were more extreme at that time than they had been in 1826, and than they would seem to have become in recent years. Dr. Dorrian, Bishop of Belfast, was asked (*Powis Commission*, 1867, Q. 9113)—"Do you associate dogmatic teaching *pari passu* in secular education?" He replied—"Our Church simply teaches us it is unsound Catholic doctrine to believe that even knowledge of natural things can be imparted without religious influence." And the same witness went so far as to maintain that even a teacher of arithmetic might inculcate heresy (quoted in *Hansard*, vol. ccxiv., p. 58).

Even the solemn declaration made by every Professor in a Queen's College to avoid controversial questions, either in religion or politics, in his lectures, failed to satisfy them:—

> "By the shrug of a shoulder, or the wink of an eye, revealed religion can be attacked, in its most vital parts, just as well as in any other way" (*Queen's Colleges Commission*, 1857, p. 249).

The Queen's College, Belfast, alone of the three, attained any measure of success. Its well-being was due, in its early years, to its strongly pronounced denominational character, which satisfied the then views of the majority of the Presbyterian Church. The Presbyterians, in 1844, had collected large subscriptions, and had sought to establish a Presbyterian College in Belfast. to take the place of the Academical Institute. But, on hearing from Sir R. Peel of his intention to found the Queen's Colleges, they suspended operations—

> "Until it should be seen whether the College to be established in the North of Ireland would be suitable for our object."

It was not until the Professors and Deans of Residence were appointed, in October, 1849, that they passed a Resolution permitting the students to attend the classes in the Colleges, viz.:—

> "That, whereas Her Majesty's Government have enabled us to provide for the religious instruction of all our students by an endowment of a Theological Faculty under our own exclusive jurisdiction: and whereas one of our ministers, in whose capacity and paternal care we have entire confidence, has been appointed Dean of Residence, to whom has been committed the constant inspection and care of the conduct of the students: and whereas the qualifications and character of the persons appointed in the Queen's College, Belfast, for those classes which the students of this Church have hitherto been required to attend, are such as to justify this Assembly in accepting certificates and degrees from that College: We now permit them to attend the classes of that Department in the Queen's College."—(*Queen's Colleges Commission*, 1857, p. 53.)

The Queen's Colleges of Cork and Galway were not supported in a loyal spirit by the Government, and were condemned by the Episcopalians and Roman Catholics as "godless." At one time the opposition of the latter was so strong that the President of Cork (Sir R. Kane) declared that it was difficult for his family to reside in Cork.

> "A Roman Catholic family resident in the College, particularly a young family, would be placed with regard to the ministers of their own Church, in a position which would be exceedingly disagreeable —which would be, in fact, intolerable" (*Ib.*, p. 148).

6948. Most Rev. Dr. HEALY.—There are a few points as to which I desire to ask you a few questions. In the first place—and I want to ask it merely for information's sake—it appears the first real concession made to Catholics was in 1793, when the Relief Bill was passed, enabling them to become Professors of Trinity College. Now yesterday—I think you will recollect yourself—I put a somewhat similar question to Mr. Lecky, as to whether official posts in Trinity College—I think those were the words I used; I certainly meant Professorships——?—I think, my lord you mentioned the word "Professorships."

6949. Did I—very well. Mr. Lecky, to whose authority I bow, did not say anything of that kind; he only said that degrees were thrown open. What I would wish to know from you is, Is it really a fact that the Professorships were then thrown open?—I believe, my lord, I am perfectly accurate in saying that Professorships were thrown open, but this Commission produced no fruit for many years, because, as a matter of fact, no Catholics were appointed, I think, until the year 1840, when the Professor of Italian, who was a Catholic, received an appointment.

6950. Chief Baron Palles, I think, said, the other day, that very liberal proposals were made to establish a College for Catholics in connection with the University of Dublin——

6951. Mr. Justice MADDEN.—There was a clause which referred to such a College, but no provision was made for it?—No.

6952. Most Rev. Dr. HEALY.—The opening of Professorships had no reference to that College thereafter to be founded?—No; it was with reference only to Trinity College.

6953. Are you able to guarantee the accuracy of the quotations in the historical analysis that you have presented to us?—To a considerable extent; I made most of the extracts myself, and I have referred to the sources of my information—the original documents.

6954. I hadn't time yet to read over this paper, and that is why I ask you?—Some of them I made from Miss Wyse's book; but, as a matter of fact, I had collected nine-tenths of them before I got her book.

6955. Where you don't refer to that pamphlet or book specifically I may take it that you verified those extracts yourself?—Yes. In most cases I made the extracts myself from *Hansard*, &c.; but in a few cases I am indebted to others for references. These I have specified.

6956. I think you had to take some extracts from Miss Wyse's book?—I read over that book; but I know that it would not be safe to accept all the statements in it, so where I took a statement from Miss Wyse's work I stated so, and have given the reference.

6957. There are some quotations taken, or purporting to be taken, from private letters?—Yes; in some cases, where I have quoted private letters, I have stated the source; some of them are given in Miss Wyse's book, and in other cases they are contained in Dr. Murray's life, and other letters appeared in the *Galway Vindicator*.

6958. The reason I ask you in reference to that matter is this, because the subject is more or less controversial, and, as a matter of history, it is extremely important that an extract should be authentic, because even the change of a word sometimes, or the omission of a word, will make a very great difference in sense?—Quite so; in correcting the proofs, I shall take care to compare the words with the original text. This

document was rather hurriedly put together, but I shall spend some more time in a re-examination of it in order that it may be as accurate as it is possible for me to make it.

Most Rev. Dr. HEALY.—Otherwise I think it is of chiefly academic interest, as giving a history of the controversy regarding the institution of the Queen's Colleges in 1845, and from that point of view these extracts are interesting, assuming them to be authentic.

6960. Professor BUTCHER.—Dr. Starkie, there are two or three allusions which you have made in pages 187 and 188, which certainly, historically, are of very singular interest. One is the letter of Mr. Corballis, and the two letters of Archbishop Murray. I should like to know whether you have had any means of ascertaining whether Mr. Corballis represented at this time any strong body of lay opinion in Ireland. He speaks as if he was more than an isolated individual, and as if he had some right to speak for Catholic laymen?—Of course, I enjoy the great advantage of not having lived at that time, and I can only appeal to the documents that I have read. But I have given you a passage from a work of Sir Charles Gavan Duffy who did live at the time, and who used to write for the *Nation* in those days, and he states that a large number of the "Young Ireland" party were strongly in favour of the Queen's Colleges. As you know, at that time there was a struggle going on between the followers of O'Connell and the Young Irelanders, and on the Question of the Queen's Colleges there was a striking difference of opinion between them.

6961. It is striking in view of the fact that Catholic laymen have hardly ever spoken or written in that sense since. I was going to ask you whether you could not indicate what appeared to you to be the differences between the proposals and intentions as shown on documentary evidence, between Sir Robert Peel's proposals in reference to the Queen's Colleges, and the suggestions that have been made, we will say, by Mr. Balfour more recently: Are there any marked differences of principle, do you think?—I think that if the Queen's Colleges had been accepted by the Hierarchy in 1845, as they were accepted by the minority of the Catholic Prelates, that the two schemes would have worked out in an identical fashion.

6962. Mr. Balfour proposed no tests?—Yes, Mr. Balfour proposed no tests.

6963. And, similarly, there were no tests in Sir Robert Peel's scheme?—There were no tests in Sir Robert Peel's scheme for the Queen's Colleges, and a second point of similarity is this—that Mr. Balfour refused to endow religion, and Sir Robert Peel refused to endow religion, and, I think, that was one of the chief causes of the wrecking of the scheme.

6964. Now, on the other hand, they differed, I suppose, in this: the patronage was, at least at first, up to 1848, in the hands of the Crown; the Professors were to be appointed by the Crown?—I think Mr. Balfour, on account of the difference of the times, though, indeed, he was not supported by his own party, was able to speak more openly than Sir Robert Peel ventured to do. I think, from the documents, that Sir Robert Peel made private representations to the Bishops, and so did Lord Clarendon later on, to the effect that the governing bodies of the Colleges at Cork and Galway would be mainly Catholic. But Mr. Balfour actually promised, at first, at any rate, that the governing body of the Catholic College which he proposed would be entirely Catholic.

6965. Do you think that what wrecked the scheme—I want to draw a conclusion somewhat historically arising from the failure of the past schemes—do you think that what wrecked the scheme was the refusal of the Crown to give any kind of pledge as to the appointment of Professors that would be satisfactory to the Roman Catholic Church?—Although I have considered the question for many years, I find it very difficult to understand what really wrecked the Queen's Colleges. I think the Government ought to have made more concessions, *e.g.*, by giving salaries to the Deans of Residence; but, on the other hand, I think the Catholic Prelates should have had more confidence in Sir Robert Peel's good intentions. There is no doubt that the Government ought to have agreed to appoint alternative Professors in Philosophy and History. Their refusal to do so was a fatal error of judgment, and, I think, they were partly responsible for what followed.

6966. Mr. WILFRID WARD.—One question rather in pursuance of the question raised by Professor Butcher. I was very much interested in reading a passage quoted by you at page 14, from Greville's Memoirs, in which he described an interview with Dr. Wiseman, in which the latter used words—which I will read to make my meaning plain—Dr. Wiseman said that, "It was all owing to there being no English Ambassador at Rome, and no representation of the moderate Irish clergy"—that is to say, that the opposition at Rome to the Queen's Colleges was all owing to this, that there was no representation there of the moderate Irish Catholic party, which Dr. Murray represented in Ireland, and that—"Irish ecclesiastical affairs were managed by MacHale through Franzoni, head of the Propaganda, and Father Ventura, who has the Pope's ear, and he strongly advised that Murray and his party should send an agent to Rome." Would that seem to give the right explanation of the ultimate failure of the Queen's Colleges?—No doubt; but one must separate the Curia from the Irish Bishops. The Irish Bishops condemned the scheme upon four occasions, and they made representations to Rome through Archbishop MacHale. In fact, Miss Wyse, I do not know whether accurately or not, says that Dr. MacHale hurried to Rome himself and saw the Pope personally, and that it was through his influence that the scheme was condemned. I have always understood,—and I have quoted the words of an Irish member of Parliament, Mr. Power, in support of that view—that the Pope's condemnation was founded upon the representations made by certain Bishops in Ireland, rather than upon any knowledge he had of the real state of things. I have no doubt that, if the moderate party, the party of Archbishop Murray, had been represented in Rome, the Curia might have come to a different decision.

6967. And, if so, that would have reacted upon the attitude of the Irish Bishops?—I have no doubt that that would have been so. I am strongly of opinion, of course, that mixed education in the abstract is dangerous. Everything depends upon the safeguards. But the Government, when the Bill went into Committee, did propose certain safeguards which satisfied Archbishop Murray, and my present opinion is, that if those safeguards had been sympathetically represented to the Vatican they would have satisfied the Pope.

6968. Do you know the date of the interview between Mr. Greville and Dr. Wiseman?—It was in 1847. That was the year Archbishop MacHale went to Rome, according to Miss Wyse.

6969. In the next paragraph of your paper, at page 189, you give another quotation from Mr. Greville to the effect that efforts were continued at Rome by Dr. Murray's party, and that they did not despair of changing the action of the other Irish Bishops, until Lord John Russell's Durham letter gave the Roman authorities such a bad opinion of the fairness of the English Government, that the famous Rescript was issued on 23rd of May, 1851, which gave the fatal blow to the Colleges. Is it the result of your study of the matter that that is a true explanation of it?—I think it had a great deal to do with it. Archbishop Murray states in one of his letters that the Bishops made representations to Rome to have some of the resolutions of the Synod of Thurles not sanctioned. I believe thirteen of the Bishops were anxious to make use of the Queen's Colleges. I am satisfied from his letters, and also from one of my friends who knew him, that Archbishop Murray did not approve absolutely of the Queen's College scheme, but that he thought nothing better could be got, and that, in view of the fact that the Government had consented to have Catholic Deans of Residence and Catholic houses of residence under the control of the Bishop of the diocese, he thought that such a provision would be a sufficient safeguard to make the scheme work in a way that would not be so dangerous as some anticipated, to the faith and morals of Catholics. As to the particular cause that led to the sanction of the decree forbidding Catholic priests, under canonical censure, to have anything to do with the administration of the Colleges, there are two reasons which, I venture to suggest, had weight with the Vatican. The first was that a Catholic University was about to be founded. In 1850 the Synod decided to establish a Catholic University, and Cardinal Newman came over to Dublin in 1851, and that scheme being in the air, I have no doubt that, as practical men, the Bishops, and also the Vatican, were convinced that unless they prohibited Catholics from going to the Queen's Colleges, their own Catholic University would have very little chance of success, and I am sure, as practical men,

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that consideration weighed with them. Secondly, the feeling in England was so strong against Catholics on account of the action of the Vatican in connection with the Ecclesiastical Titles, that I am certain it must have had very great weight in Rome in making the Vatican less amenable to the representations of the British Government in favour of the Colleges.

6970. Most Rev. Dr. HEALY.—You said a while ago that you failed to see any substantial reason for the condemnation of the Queen's Colleges by the Bishops?—Yes, that is my opinion.

6971. At page 187 of your statement you quote from Archbishop MacHale's letter to Sir Robert Peel, in which he lays special stress on the rejection of the Memorial of the Catholic Bishops, and he based the condemnation of the scheme, not merely on the ground that the scheme was objectionable, but also on the fact that they refused to make any concession to the repeated resolutions and Memorial of the Bishops—was not that a substantial reason for the condemnation?—It would be substantial, if it were accurate.

6972. Do you mean to say it was not accurate?—I mean to say it was not accurate.

6973. I am sorry I cannot agree with you in that?—I do not think it is fair to say that the Government refused to make any concessions. At first they certainly did so, but when the Bill was in Committee, they accepted many of the recommendations of the Bishops. They established Deans of Residence, promised to give facilities for the founding of Halls of Residence under the control of the Bishops—they conceded that a fair proportion of the Professors and other officers should be members of the Catholic Church. They promised to take the utmost care in selecting proper persons for the institutions which were to be established in Munster and Connaught, though they were unwilling to tie down the discrimination of the Crown by an enactment.

6974. May I ask what do you think of the proposal that Catholic Professors should be appointed—was it reasonable?—Yes; in my opinion it was not only reasonable, but necessary.

6975. Was it acted upon?—Well, before the carrying out of the scheme, there was a change of Government.

6976. Was it not a justification of the action of the Catholic Bishops, and of their apprehensions, that the Government were, by the scheme of the Queen's Colleges, attempting to undermine the faith of Catholic students, that though professedly establishing the Colleges for the education of Catholics, they, nevertheless, out of twenty Professors, appointed seventeen Protestants?—That was done by a different Government.

6977. I do not care about it being a different Government; it was done by the British Government, and I recognise it as all one.

The Commission adjourned until the following morning.

NINETEENTH DAY.

LONDON.
Dec. 20, 1901.

FRIDAY, DECEMBER 20, 1901.

AT 11 O'CLOCK, A.M.

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman); The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.; The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.; Sir RICHARD CLAVERHOUSE JEBB, LITT.D., LL.D., D.C.L., M.P.; Professor S. H. BUTCHER, LITT.D., LL.D.; Professor J. A. EWING, M.A., LL.D., F.R.S.; Professor JOHN RHYS, M.A., D.LITT.; Professor J. LORRAIN SMITH, M.A., M.D., WILLIAM J. M. STARKIE, Esq., LITT.D.; WILFRID WARD, Esq., B.A.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

G. JOHNSTONE STONEY, ESQ., M.A., D.SC., F.R.S., formerly Professor, and afterwards Secretary, of the Queen's University in Ireland, examined.

G. Johnstone Stoney, Esq., M.A., D.SC., F.R.S.

6978. CHAIRMAN.—Dr. Stoney, you are a Master of Arts, Doctor of Science, Fellow of the Royal Society, and, I think, you were formerly Professor in the Queen's University in Dublin?—I was. I was Professor for five years, attached to one of the Colleges of the University—to the College at Galway.

6979. And afterwards you were Secretary of the Queen's University?—I was afterwards, for twenty-five years, Secretary to the Queen's University.

6980. Then you have, I believe, a very complete knowledge of the position and requirements of higher education in Ireland?—Well, I ought to have.

6981. I think you have been good enough, Dr. Stoney, to put together your views upon various topics bearing on this question, and the Commission would be obliged to you if you would proceed to favour us with your views on them, taking them in your own order?—Thank you. Well, my lord, the first point to which I would wish to invite the attention of the Commissioners is that there have been two policies advocated in Ireland—two main policies—in reference to the provision for the University Education of Irishmen; and I will describe the first by using the language that was made use of by Bishop Doyle.* He was asked whether he considered it desirable that the Roman Catholic laity should be educated jointly with the Protestants, and he replied, "I see no objection whatever that they should be educated together. On the contrary, if by being educated together the harmony of the different sects in Ireland could be promoted, I think it would be a matter to be desired." Then he is asked, "If they were so educated together at Trinity College, Dublin, must they not have separate Professors of their own faith to instruct the young men?" Then Bishop Doyle's reply is, "That would not be necessary for those who attend College, as many of those who enter there can lodge in town, and receive religious instruction where they please; and even those who reside within Trinity College have sufficient opportunities of obtaining religious instruction abroad on Sundays." Then he proceeds to point out that the Roman Catholics in Trinity College are not obliged to attend prayers with others, and that, of course, they would resort to the prayers of their own Church. Well, now, the next statement that I would bring forward is that of a Roman Catholic layman, Mr. Corballis, who was a well-known representative of the Roman Catholic laity at the time when the Synod of Thurles was held. He, writing to Archbishop Murray, says†:—"To many of us it appears altogether inexplicable, that, after petitioning, in the days of persecution, for admission into Trinity College—after having permitted, with the tacit sanction of your Grace and your eminent predecessors and colleagues in the Church of Ireland for upwards of half a century, to receive our education there—and seeing that one of the members of that very Synod ("the Synod of Thurles"), most distinguished for rank, is actually a graduate of the University, it does appear strange that, in the year 1850, education in Trinity College, or even in any of the Colleges recently established on such a liberal footing as regards us, should be unequivocally condemned; and that without one reason being assigned for this sudden change." To that Archbishop Murray replied—"I participate fully in the deep anxiety which you so justly feel; but I must pray you not to press me to enter at this moment into details on the painful subject to which you allude. I may, however, mention that a petition, signed by thirteen Bishops, has probably, ere this, reached Rome, supplicating our Most Holy Father, Pius IX., to refuse his sanction to certain proposals on points yet undecided relative to the subject of academical education." Archbishop Crolly, who was at that time Roman Catholic Archbishop of Armagh and Primate of Ireland, had moved to get one of the Queen's Colleges established in his diocese. I should mention that I have been in great difficulty on account of being separated from many sources of information that I had access to when I was in the Queen's University Office in Ireland, in bringing before the Commission those pieces of evidence which I have been able in a short time and under these circumstances to collect.

6982. I think, Dr. Stoney, it might be well to inform you that we are already in possession of the information on the subject contained in Miss Wyse's book?—He mentions what I have said about Dr. Crolly. I was going to read his statement in reference to it. You have also got his speech,‡ in which he said—"It was said to be impossible to convert the University of Dublin to Catholic purposes; on this point, however, there was much misconception. That University might be opened to national purposes, whether those purposes were Roman Catholic or Protestant. . . . By the Acts of 1793 Roman Catholics were again admitted to the education of the University, but were excluded from Fellowships, and this was now the case. The University was governed by Fellows, who were obliged to take Orders and the Sacrament, previously to taking their degree, and consequently, Catholics were excluded; but there was no reason why the Fellows should be compelled to take Orders or the Sacrament." Well, Dr. Starkie will be able to inform you that that prohibition was completely removed by the University of Dublin Tests Act of 1873, and that the claim made by the Catholic Bishops and laity up to the holding of the Synod of Thurles has now for many years been completely complied with.

Now, that is one policy. The other policy is that of keeping the Roman Catholics and Protestants receiving University Education in separate camps, as it has been described, with clerical sentinels pacing up and down between them; and I will proceed to give evidence to show that that was a foreign claim which was pressed upon Ireland, and not a claim that arose spontaneously from Ireland, either from the clergy or the laity. I will first state, as distinctly as I can, what the claim

* Parliamentary Papers, 1825, vol. IX., p. 243. † *Galway Vindicator*, of 2nd October, 1850. ‡ *Times*, July 20, 1844

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is. This is a statement of the claim as made by Cardinal Cullen, who was at that time Archbishop of Armagh. "The right which we enjoy"—this is in his letter to the clergy of his diocese, written in November, 1850—"and the obligation under which we are placed of attending to the education of youth, are derived from the Divine commission by which we exercise our spiritual ministry. This commission, which was given to the Apostles and their successors in the following words—'Going, therefore, teach ye all nations, baptising them in the name of the Father, and of the Son, and of the Holy Ghost, teaching them to observe all things whatsoever I have commanded you, and, behold, I am with you all days, even to the consummation of the world.' This commission evidently includes the duty of teaching all the dogmas of Faith, as well as all the principles of morality . . . all this is directly contained in the Divine Commission—but the subjects thus indicated must have a direct or indirect connection with the various departments of human knowledge, and the exercise of the Divine commission must, consequently, extend to the supervision and control of every system of education proposed or instituted for the children of the Catholic Church." Now, in conformity with that the Roman Catholic Bishops, in 1866, drew up a draft of the Charter which they proposed for a College to be endowed out of public money; and one of the provisions in it was—"That the four Roman Catholic Archbishops for the time being shall be Visitors of the said College, and their authority be supreme in questions regarding religion or morals, and in all other things in the said College."*

Now, that is a claim to which no Roman Catholic Government in Europe has acceded. I should mention that Dr. Doyle, in the course of his evidence, explained that until the death of the last Pretender, that is the last before Cardinal York, and after the abdication of James II.—a recommendation used sometimes to be made by the Pretender to the Holy See, and the appointment of Bishops took place in accordance with it. The name of the last Bishop who was appointed in that way, on the recommendation of the Pretender is Dr. Burke; and Bishop Doyle gave evidence to the effect that from that time on, the uniform practice in the Catholic Church was, that a recommendation went forward from Ireland, either from the priests of the diocese in which the vacancy arose, or from the Chapter, and always accompanied by a supplementary recommendation from the Bishops, and that in this recommendation three names were submitted in the order of *dignissimus*, *dignior*, *dignus*, and the person most recommended from Ireland was always appointed. Bishop Doyle was asked—several times the inquiry turned to this point—in reference to its security. I will give one of his answers†—"I mentioned on a former day, and I repeat now, that the Pope has in him a naked right of appointing whom he pleases to a See in Ireland; but I added then, and I repeat now, that we are not to suppose that he would attempt to intrude into our Church an individual who was not recommended to him from Ireland. If he did so, I will not presume to say that such a person would not be received, but, however, I think it would be extremely difficult for him to take possession of his jurisdiction, or to administer in it the laws of the Church. The Committee will be pleased to observe that I recognise in the Pope the naked right to do so, but yet I think the exercise of that right is morally impossible." In other parts of his evidence he brought forward a suggestion that the government of the United Kingdom should enter into a concordat with the Pope with the view of making it necessary for the recommendation to go forward from Ireland in every case. This was before the Emancipation Act was passed, and it was very largely upon this evidence that a great number of politicians were brought round to consent to that Act—the Catholic Emancipation Act of 1829.

6983. CHAIRMAN.—I really must venture to suggest that we are getting a little wide of the subject of our Reference?—(*Witness*).—I beg your pardon; what I am endeavouring to prove is, that the demand for separate education is a foreign demand. I have now shown that the demand for united education was a home demand—a demand made in Ireland. The proof that the other was a foreign demand goes on to a much later date. There were three Rescripts in reference to the proposed Queen's Colleges in Ireland that were received from Rome, and in one of those Rescripts the Archbishops and Bishops of Ireland were forbidden to take any part in carrying them out, and it was pressed that, "of all things the Sacred Congregation would deem it most advantageous that the Bishops, uniting their exertions should erect in Ireland a Catholic Academy on the model of that which the prelates of Belgium founded in the city of Louvain." Then in the last Rescript it is said—"As to other controversies raised on the subject of the said Colleges, it will be the business of the Bishops, after having diligently weighed the above-mentioned Rescripts to frame such rules to be everywhere observed for withholding the faithful from frequenting those Colleges." It was in that way from abroad that this demand for separate education was pressed upon Ireland. And the way in which it was carried by the Synod of Thurles was this. I have shown that Bishop Doyle gave evidence that it was morally impossible for a Bishop to be forced by mere prerogative upon the Irish Church, without having been recommended from Ireland; but in 1849 Dr. Cullen was so forced, and appointed, to succeed Dr. Crolly as Archbishop of Armagh. He was further appointed delegate of the Apostolic See, which gave him precedence over Dr. Murray, who was the Archbishop of Dublin, and who, otherwise, would have been the person to convene the Synod. The summonses were issued at a time when, or shortly after, three prelates were ill, two of whom were known to be opposed to the policy of separate education. I have here the signatures of the prelates who were present. There were twenty-three Bishops present, and there was also an Apostolic Administrator of one of the dioceses, whom we may count as a Bishop. There were, then, Procurators, or substitutes, for those three Bishops who were ill, and two of whom would have voted for the Queen's Colleges—and in each case a person was appointed as a substitute, who voted the opposite way. There was also, to the great surprise, at the time, of many of the Bishops who were present—there was introduced, by privilege, to the Synod, a mitred Abbot, Francis Bruno, and he also added another vote. Even after all these measures were taken, there was only a majority of one against the Queen's Colleges, where there ought, properly, to have been a majority of four in their favour. For a great number of years after that there was great dissatisfaction, even among the priests of Ireland—the parish priests—who, in the Roman Catholic Church, have a certain amount of independence, though very far short of what a Protestant rector has, and the way in which their power was crushed was, by leaving a vast number of parishes in Ireland without parish priests. I forget what the total came to, but there was, in a very large number of cases, when vacancies arose, an "administrator" appointed in place of the parish priest; and the administrator was a man who, under the rules of the Catholic Church, was not a parish priest, but a curate directly at the disposal of his Bishop.

6984. Most Rev. Dr. HEALY.—May I take the liberty of suggesting, with the leave of the Chairman, that the statements of the witness with reference to the internal discipline of the Catholic Church in Ireland are hardly matters which ought to come before this Commission?

6985. CHAIRMAN (to the *Witness*).—Perhaps you will kindly withdraw for a few minutes. We must consider this?—(*Witness*).—I think I have said all that I desire to say on the subject.

Most Rev. Dr. HEALY.—I merely bring the matter under the notice of the Chairman—I do not want the Chairman to go to any trouble in the matter; but I would suggest that Dr. Stoney should be asked to keep a little more to the points that we have to consider.

6986. CHAIRMAN.—I must say, Dr. Stoney, that I do think that, interesting as those matters are to which you have referred, they are somewhat remote from the practical questions which we have to consider?—(*Witness*).—Of course, my lord, I must bow to that decision, although I do not concur in it. Well, the question as to what is meant by a Catholic University is determined by what I have already read from the Rescript. What was proposed, and what was pressed upon Ireland was, that a College similar to the College at Louvain should be established in Ireland; and we all know that the Colleges in Belgium—that at Louvain and the other Colleges at Ghent, Liege, and Brussels, are called Universities, that is the nomenclature that is in use in Belgium; and the important point is that of the two policies, one of them, the one to which I have devoted thirty years of my life, is, that of trying to bring Catholics and Protestants into personal intercourse with one another, so that each of them should

* Parliamentary Paper 84, of the year 1866.

† Parliamentary Papers of 1825, vol. VIII., p. 211.

know what the others are from actual experience; instead of the opposite policy, of keeping them cooped up in separate cages, forming their conceptions of one another, instead of forming their perceptions of one another by actual association. All experience shows—and I do not think there is a place in the whole of Europe that is a greater example of it than Belgium—that by the practice of keeping them cooped up in separate enclosures men will always form more unfavourable impressions of each other, than under circumstances in which they are brought into daily contact with one another. I had several friends, during my own College days, who were Roman Catholics, being myself a Protestant, and I feel the immense benefit that it has been to me to have had that continual intercourse with those men. The differences between man and man, with which we are dealing round this board—those differences are like the differences in men's heights—they are to be measured in inches, while what they have in common is to be measured in feet. And it is just the same when you bring young men together in College; they find out how much they have in common. I am now speaking for the whole future benefit of my country, and I believe that that largely depends upon not keeping the University students cooped up in separation from one another. Those men, when they grow up, become the natural teachers of the rest of the community, so far as teaching emanates from any lay source. For several years I made it my business to read up all the Belgian papers that I could, and I think that the language and feelings that are entertained there by the two parties of Catholics—for, as you know, they are all Catholics, though divided into the two parties, which are called "Liberals" and "Clericals"—the feelings entertained, and the language used by each party towards the other, are frightful. What I want is to try and have Ireland saved, in the future, from that terrible misfortune.

I now come to a very remarkable fact, which, probably, most Englishmen do not understand, in reference to Ireland, and that is that no public inquiry will elicit the true views of educated lay Roman Catholics in Ireland. Any man who has passed his life in Ireland, as I have done, knows that that is the case. And why? I have always felt the greatest sympathy with their position, and the greatest feeling that the condemnation that they meet with for expresing themselves freely in private in one way, and not being able to get them to come forward and publicly state their views—I have always felt that that ought not to be regarded as a reproach against them. For what is the experience of every country in Europe? The experience of every Catholic country in Europe is that it requires the whole of the lay thought of the country (which is, necessarily, very little organised) to form anything approaching an equipoise to the strictly drilled ecclesiastical thought, which has all the force that arises from concentration. On that account it is impossible to obtain the true lay views from public statements, through such a document, for instance, as the document which has been put forward, signed by a number of Roman Catholic laymen, in favour of a Roman Catholic University. Why, any one that knows Ireland knows that that is not worth that—(*Witness snapped his thumb*)—that it is not worth anything as evidence that any considerable proportion of intelligent laymen approve of the demands made by the Hierarchy. The only way to get such evidence would be to get hold of those men, and to ascertain what their real views are, when you have them under circumstances in which they won't expose themselves to the misfortune that pursues any Irish Catholic if he stands openly against the ecclesiastical aims. Ecclesiastical aims, we must remember, have a tendency to encroach beyond what any body of intelligent laymen have ever admitted to be the legitimate province of the Church. I gave an instance of that. For instance, in Archbishop Cullen's interpretation of the passage in St. Matthew, where he, by a well-known form of fallacy, extends it, step by step, until he makes it include the whole of education, whereas the true meaning of the passage, when you read it carefully, is that the Apostles were directed to make disciples of all nations, and they were told what they were to teach them, and what they were to teach them was, to observe whatever Christ had commanded them. Now that is an utterly different thing from handing over to ecclesiastics complete command over all education.

I now come to a number of statistical errors which are very frequently made. The Catholic population, numerically, is to the Protestants in Ireland, about three to one, more than the whole of that difference being peasantry and unskilled labourers. But in reference to the professions, the higher trades, or other positions, from which men would generally supply their sons to Universities, the proportion of Catholics to Protestants is between one to three and one to two; and it is a very remarkable thing, to be mentioned in this connection, that one of the professional classes, which, more than any other, supplies sons to the Universities, both in Ireland and England, amongst Protestants, is the clerical profession. Now, on the Catholic side there is nothing to correspond: there are no sons of the celibate priesthood of the Catholic Church. Then, again, in all statistical statements the whole, or almost quite the whole, of the Protestant youths preparing for the ministry of the various Protestant Churches are included upon the one side, while on the other side none of the youths preparing for the Catholic ministry are included. If they were, the statistics would stand immensely different from the way in which they are generally presented, because in Ireland you have got about 3,000—I think it is 3,014—about 3,000 priests. That is an army that has to be recruited, and they are all recruited from the College of Maynooth. But besides this, the Catholic Church aims at drawing from Ireland almost all the priests for all the English-speaking peoples of the world. If you go to the United States, if you go to the English-speaking parts of Canada, if you go to Australia, if you go to South Africa—even here, in England, the majority of the priests are all Irish, and in order to draw this immense supply of priests the Catholic Church aims at taking the pick of all the cleverer boys—all the "possibilities," as they are sometimes termed—all the boys that would be likely to benefit by an advanced education; and they are drawn away partly to Maynooth, and partly to the very large number of Colleges which are preparing priests for the foreign missions, as they are called, that is, for the priesthood of other countries, such as the Colleges at Drumcondra, Mount Argus, Terenure College, Mount Orlagh, and some others about Dublin, and throughout Ireland; along with the many Colleges and Seminaries abroad, which also are engaged in preparing Irish lads for the priesthood. Now, when this enormous army is drawn it exhausts, or almost practically exhausts, the supply of candidates for University training, from the whole of the farmer and peasant class. Now from those classes among the Protestants there are, of course, some recruits for the Universities, and that must be taken into account. But the case is even stronger than I have put it, because, if generation after generation, you withdraw all, or most of, the lads who have an aptitude for benefiting by an advanced education, you will undoubtedly, upon principles which are perfectly well understood, diminish the number of cases in which that type of men will appear amongst a population so treated. You must remember that every one of those men becomes a celibate; he leaves no children, and anyone breeding cattle even will know what the effect of that must inevitably be. But the great thing that has operated in reference to the peasant and farming classes, which are the great majority of the Catholic population—the great thing that has operated is that those lads who have minds capable of benefiting by University training are snapped up for the priesthood, and that has been going on for a very long time. Now, if a clever lad goes to the University of Dublin, or to one of the Queen's Colleges, he is more likely to pursue a lay career than an ecclesiastical career, and, in fact, it will be observed that that is the case with the clever lads in Ireland, who go to the Model Schools, which are a better class of schools than the ordinary National Schools, and one of the greatest benefits ever conferred upon the peasantry of Ireland—a better class of school providing a somewhat more advanced education to lads belonging to the humbler classes. Now they, as well as the Queen's Colleges were denounced; and is it not very plain that they were denounced because they were competing with the Church for the boys that they wanted to become priests? These things are known to Catholics, and are privately expressed in Ireland; but you will not get them to come forward and publicly express them. The object of the establishment of a Catholic University is not to supplement the opportunities for University Education already in existence, but to supplant them, and to withhold students whose parents, and who themselves wish to obtain a better and more open University Education, and to compel them to fore-

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go that education, and to accept instead that of a seminary under the control of ecclesiastics. Now, in connection with that there has largely developed in Ireland an effort which is producing, I believe, very great mischief in the country, and that is, the trying to keep out of public employment through the country any Catholics excepting those who have completely submitted to the ecclesiastical demands, as well as almost all Protestants. Now these aims will, all of them, be immensely advanced to the detriment of Irish Catholics as well as Protestants if a Catholic University is granted.

It has been said, sometimes, that Roman Catholics could not be expected to be satisfied to obtain their education in a University that was largely officered by men of a different faith. Now I have had a very large experience of Roman Catholic students, and my experience is that every serious student prefers one teacher to another, not in the least on account of what his religious persuasion may be, but altogether in consideration of how great his efficiency is as a teacher; and accordingly, in the Colleges of the Queen's University, every effort was made, in every case (or almost every case—for nothing of the kind in sublunary affairs can be carried out to perfection)—but in almost every case an effort was made to appoint the best man to fill each vacancy as it arose. And it was in that way that the Queen's Colleges—partly in that way, and partly by the very intimate relation in which the Colleges of the University stood to the University examinations upon which degrees were founded—it was in those ways that the efficiency of the Queen's Colleges was developed. And the outcome has been, I think, the most remarkable that the history of the world can show, for a University that was only thirty years old when it was dissolved. If you go to India, China—almost everywhere over the British Empire—you will find graduates of the Queen's University. For instance, in China you have Sir Robert Hart, who is at the head of the Maritime Customs of China, having been transferred from our Consular service to the Chinese service. Another distinguished graduate of the Queen's University in the British Consular service in the East was the late Sir James Russell. In India you have got Sir Anthony M'Donnell, Governor of the North-West Provinces; Sir Raymond West, who was Chief Justice of Bombay, and is now in connection with Cambridge; Mr. O'Kenealy, and Sir David Barber, who has been made great use of by the Government in relation to financial questions in other parts of the Empire, and a host of others—the list is an enormously long one. So in other careers. At the Bar a host of eminent lawyers were educated in this short-lived University, headed by the present Master of the Rolls in Ireland, the late Mr. Justice Monroe, and the present Attorney-General. To the medical profession it contributed the late Sir William MacCormac and many other distinguished men. Similarly, in the clerical profession, among engineers, and in connection with the foremost papers of the British Press. If the whole list of distinguished men could be passed under review, it would show a most extraordinary output for a University that was left in existence for only thirty-two years. Two great features of the education which was developed in the Queen's Colleges were the power of stating in clear and terse English whatever was to be described, and the power of mastering new matter. Those features were very remarkably developed by the training given in the Queen's University. The University, however, met with detraction and denial of its merits from the very first, and I think there is nothing which more shows how inadvisable it is to keep constantly harassing University Education in Ireland than the history of the Queen's University, which is presented upon this diagram.* This diagram represents the number of students attending in the successive years from the opening of the Queen's University until its dissolution, and the fluctuations in its numbers are very conspicuous and instructive. I may mention that the maximum number was 1,170, and the numbers crept up to that—(*pointing*)—at the time when the Queen's University was dissolved. There were, in the first session, 378 and then the number went on slowly increasing for a couple of years, until the Synod of Thurles was held, and the condemnation of the Colleges led to a drop in the numbers. Then, after this drop, the numbers still went on increasing, until a few years later, the attacks constantly being made on the Colleges led to the appointment of a Royal Commission to enquire into these young institutions—to pull them up in the same childish manner, as a child when it gets its first garden pulls the plants up the next day to see whether they are growing. In the following year that Commission reported, and made the truth somewhat known about the Colleges. The consequence was that the numbers for some years increased. Then came the announcement, made in Parliament, that it was intended to alter the constitution of the University, and the numbers immediately went down. Then after some time, a supplemental Charter, altering the constitution of the University, was issued by Mr. Gladstone, and a trial took place with regard to this Charter, which was contested, and in the Rolls Court it was upset; the result immediately was that the numbers again began to creep up. However, there were continued threatenings to alter University Education in Ireland which led to the increase going on very slightly, until at length Mr. Gladstone announced his celebrated Upas Tree policy, and the instant it was defeated—the instant Mr. Gladstone's University Bill was defeated, and his Government went out upon the question—immediately the numbers rose, and they went on steadily rising during a number of years when, although the Colleges were being attacked there was not much symptom of political men yielding to the persons who wished to destroy them. Then came the date at which the Royal University Act passed, under which the Queen's University was two years afterwards dissolved; but when it came out it was not believed in Ireland, that that policy would be carried out, of destroying a true University, which had established the most intimate relations between the University functions and the teaching functions in its Colleges; especially as the legislation had been obtained by false statements made in Parliament, and as the whole of the legislation had been hurried through within one fortnight. On these grounds it was not believed that the legislation would be carried out, and the numbers still went on increasing, until, in 1882, the University was dissolved, and immediately the numbers fell. Now, that is an indication of the mischief that arises from this perpetual harassing of the Universities in Ireland, and one of the chief things of importance is that they should not be harassed, or as little harassed as possible, by the action of this Commission. May I hand in this paper?

6987. CHAIRMAN.—What is it?—A summary of the steps taken by the Convocation of the Queen's University to induce the Government to reconsider the position of the University.†

6988. Thank you?—It is a very instructive document in many parts. I also hand in an important statement drawn up by the Annual Committee of Convocation by direction of Convocation, upon the Irish University Education Question.‡ Now, I think I have sufficiently indicated the mischief that is done by politicians holding out hopes that they will concede demands which would do incalculable harm to Ireland; and it must be remembered that the aim of the Catholic University College has been—not the ostensible aim, but the aim underlying it— has been, not to supplement University Education in Ireland by providing University Education for persons who themselves entertain any religious objection to being educated along with their fellow countrymen; but it is to form a lever by which the pressure upon parents and upon young men can be so increased as to make it impossible for them to take advantage of the better education that can be obtained elsewhere.

I think I have gone through most of the heads of what I wanted to bring forward; but I would wish, if I were allowed, to take this opportunity of putting on record what, from the experience that I have had—I believe would most advance University Education in Ireland, outside Trinity College, which, as I understand it, is the question which is proposed to this Commission. In order to introduce it I must quote the terms of the Act of Parliament under which the Royal University was founded. Here are the provisions with reference to the holding of Fellowships:—"The said several Exhibitions, Fellowships, and other prizes, shall be awarded for proficiency in subjects of secular education, and not in respect of any subject of religious instruction." Now, the practice has been to award them without any test—any examination test, at least—and to award them in equal numbers to Protestants and to Catholics. Now every lawyer that I have spoken to holds that the Act is disobeyed by taking the religious denominations of the men into account. Then the next provision is that—"They shall be open to all students matriculating in the University"; and the scheme then proceeds to declare "that they shall be

* See page 314. † See page 308. ‡ The Irish University Education Question: A statement by the Annual Committee of the Convocation of the Queen's University in Ireland, drawn up by direction of Convocation. Dublin: Thom & Co., 1873.

awarded in respect of either relative or absolute proficiency, and subject to any conditions as to the age of the candidates, their standing in the University, their liability to perform duty, and otherwise, as the Senate shall think expedient." Now they have been granted to persons who have never been students in the University, and I believe that that is entirely illegal. It has never been brought before a Court, and has never, therefore, been tried. It is in that way that a number of Fellowships have been granted to the teachers in the Catholic University College, and of these—I am not quite sure whether they still are there—five were Jesuits, and the money that they received did not go to them, for they had taken a vow of poverty—it did not go to them, but it went to the Jesuit organisation. Now, does any person who understands anything of politics, or of the proper interpretation of Acts of Parliament, suppose that Parliament assented to that by those provisions? It is perfectly plain that they did not; and I would certainly think that a test trial ought to be held to ascertain whether it is lawful to continue that bad practice in reference to what Parliament intended to be prizes for the real students of the University.

Now the suggestions that I would wish to put on record, if the Commission will allow me, are:—

First, that no public money be expended, either directly or by a subterfuge, on any University or University College, which is under external ecclesiastical control. I hold that ecclesiastical control, the control of men who have never been educated themselves in the free atmosphere of a University, is one that is certainly destined to make the institution that they govern fall immeasurably short of what a University ought to be.

Secondly—My second suggestion is that the Queen's University be reconstituted in such form as is calculated to carry out the aim of the late Queen's University; to interweave the teaching in its Colleges and the examinations for its degrees, so that each may in the highest degree strengthen and elevate the other. That was accomplished in the late Queen's University in the greatest degree that it has ever been accomplished in any English, Scotch, or Irish University. The proposal to extinguish the Queen's University was presented to Parliament on the allegation that it was a mere Examining Board. I do not blame Lord Cairns for making that false statement. It was most unfortunate that the whole thing was rushed through in a fortnight, when there could be no opportunity of meeting it; but I do blame, whoever was the man that told him that that was the truth which was the very reverse of the truth.

Thirdly—My next suggestion is that the Royal University continue its functions of conferring degrees by examination only, but be forbidden to take religious differences between Irishmen into account in appointing to any of its offices, or in awarding any of its distinctions or prizes.

Fourthly—And the final recommendation I make is that further provision be made for post-graduate study, and for the encouragement of original work in the Colleges of the Queen's University. That is a very great want in all the Universities of Ireland—a very great want. Nothing, I believe, would tend more to raise University Education in Ireland than having satisfactory provision made for post-graduate study, and for work of an original character. I can furnish Mr. Daly, if I am allowed, with exact copies of the extracts I have read, and references to the places where they may be found.

6989. CHAIRMAN.—That will be very useful?—I would have had them ready for my examination, only that Mr. Daly informed me it was wished that I should attend a day earlier than I expected.

6990. You will have an opportunity of revising the notes of the evidence, and of appending any information that you desire, in explaining your evidence, as to the references you have made?—I could write out the whole of my evidence, if the Commission wish it.

6991. The shorthand writer, I am sure, will furnish you with an accurate transcript?—Very well, my lord.

6992. Most Rev. Dr. HEALY.—Might I ask you, Dr. Stoney, how many years you were connected with the Queen's University?—From 1852 until its dissolution—nearly thirty years.

6993. You regretted its dissolution?—Of course I did.

6994. And you would rejoice at its resurrection?—Well, I believe that its resurrection would really be the best thing for the country.

6995. I might say, in fact, without offence, that the spirit of the Queen's University still survives in yourself?—I do not know; that is a question not for me to answer. As it is twenty years since I have been in office, I am not entitled to put myself forward as representing anyone but myself.

6996. I would not be wrong in assuming, I suppose, that we may take it that the spirit of that University still survives in you?—No, I do not think you may; I do not think that any assumption of the kind may be made.

6997. Very well; I will not pursue that matter further. Now, you stated that the declarations made by the Catholic laity demanding this University Education which is now under discussion—you said those declarations were wholly valueless?—Well, I do not remember that I used that word.

6998. But you made a very significant gesture, and I wish to translate that gesture into words. The gesture was practically equivalent to saying that they were of no value whatever?—I do not think it represents the educated Roman Catholic lay opinion of Ireland—the opinion prevailing amongst educated Roman Catholics.

6999. Do you mean to intimate to the Commission that the noblemen and gentlemen who signed those declarations did not believe what they stated in their declarations?—I do not know anything about that.

7000. Is that your answer?—I am not in a position to answer for them; all I know is that I have heard cases, times out of number, in which men have *seemed* publicly to acquiesce in clerical demands, but who, in private, spoke in the strongest manner against them.

7001. Will you allow me to say that the question here regards written documents, to which those gentlemen deliberately affixed their signatures, and the question I ask is, do you wish to intimate to the Commissioners that those gentlemen affixed their signatures deliberately to those documents without believing the statements contained therein?—I apprehend that in a very great number of cases the probability——

7002. But we do not act on probabilities?—Is that they did so under great pressure.

7003. Or, in other words, that the declarations on the part of the laity were not spontaneous?—Were not spontaneous.

7004. Now, in consequence of that answer, I want to bring you face to face with the statements made by one of the witnesses before us in Dublin, of his own knowledge. The witness who made that statement of his own knowledge, is a highly honourable man, and a Privy Councillor, and known to be a Catholic gentleman of independent character. I will read his statement for you with reference to the declaration issued in 1870:—"This declaration was suggested and worked up by the Catholic laymen, and owed its origin in no way to the clergy. The men chiefly instrumental in getting it up were the late Right. Hon. Richard More O'Ferrall, Mr. Monsell (subsequently Lord Emly), Major Myles O'Reilly, and myself. The idea, I think, first originated with Mr. O'Ferrall. Major O'Reilly and I became joint honorary secretaries, and communicated with most of the peers and Members of Parliament. I have in my possession the original letters sent to me by most of the Members of Parliament in reply to my letter submitting the Declaration to them."* That statement was made to us by The O'Conor Don. It is a statement within his own knowledge as to how this Declaration of 1870 originated. Do you insinuate to this Commission that the statement of The O'Conor Don is not true?—I never said it was not true; but what I do say is, that my experience, after a large amount of intercourse with the educated Catholic laity is, that in the very great majority of cases they hold opposite views to those of that statement.

7005. But you recollect, Dr. Stoney, I am not speaking of that question at all; what I am speaking about is the origin of this particular Declaration?—Well, I am not able to speak as to that particular Declaration.

7006. Excuse me for one moment; you said that this Declaration was not a spontaneous declaration on the part of the Catholic laymen. I bring you face to face——?—I beg your pardon, I did not state that.

7007. I bring you face to face with the testimony of a gentleman of the highest honour, who was one of the originators of the Declaration, and he formally asserts before us that its origin was in no way connected with the clergy. Now, what I want to ask you is this: How can that statement of The O'Conor Don be reconciled with your statement——?—I think it is perfectly reconcilable.

7008. That the Declaration was not spontaneous?—I did not say that the Declaration was not spontaneous.

* See Appendix to First Report, page 107, q. 1819.

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I said it did not represent the view of the educated laity—of the educated Roman Catholic laity of Ireland, so far as I have had an opportunity of gauging it, and I have had considerable opportunity of gauging it. I am sure you will get a minority of men who will support a declaration of that kind—a few men who will support and advocate—just as you will get a minority of men on any question—who will hold extreme views in favour of supporting ecclesiastical pretensions; but that is not the prevailing view amongst the educated Catholic laity.

7009. I am not speaking of that; I am speaking simply and solely of the origin of the Declaration which you now assert was not spontaneous on the part of the laymen?—I did not. I am not aware that I asserted anything about its not being spontaneous.

7010. It will be in the recollection of the Commissioners whether you did or not, and it will also be upon the shorthand writer's notes, and, that being so, I will not proceed further with the question?—What I did say, I believe, was that it did not represent the views of the educated Roman Catholic laymen, so far as I have had an opportunity of ascertaining those views personally from them.

7011. As you state that, will you allow me to read the names of a number of gentlemen who head the list—The Earl of Fingall, the Earl of Granard, the Earl of Kenmare, the Earl of Dunraven, Viscount Southwell, Viscount Castlerosse, Lord Louth, Lord Vaux of Harrowden, Lord Ffrench, Lord Bellew, the Right Hon. Richard More O'Ferrall, the Right Hon. W. H. F. Cogan, the Right Hon. William Monsell, and a number of lawyers, Members of Parliament, and others, who are known to be men of very great ability. Do you mean to say that those men are not Catholics of education?—I never said anything of the kind.

7012. I thought you asserted, just a moment ago, that the Declaration did not represent the opinions of Catholics of education?—So far as I have had intercourse with them privately.

7013. You had not intercourse with any of those gentlemen whose names I have mentioned?—Not one of those you have mentioned. No, I do not think I have had.

7014. Therefore, do you not think that it is too wide a statement for you to make, that the Declaration in question does not represent the opinions of educated Catholic laymen on this question?—I do not know whether those were my words; but if they were, I think they were correct. I do not believe that that statement, after all you have read, does represent the view of the educated Catholic laity; not only do I not believe that it does, but I am satisfied it does not represent the prevailing opinion of educated Roman Catholics.

7015. From which I may infer that those are not educated Roman Catholics?—You may make that inference if you like. I say it does not follow in the least. It is a fallacy to say so.

7016. Professor RHŶS.—Dr. Stoney, touching one point which I do not understand—you said something about boys who did not wish to comply with the wishes of the Roman Catholic clergy—that they would be under some sort of embargo in their careers afterwards?—Certainly.

7017. Well, I do not quite understand what you wish to convey, so I would be glad to have it cleared up?—Well, I will give you one instance, and that is in reference to the medical profession. At present, from the information I can get from my friends in Ireland, I learn that it is almost impossible for any young man to get a dispensary throughout the country, unless he has been educated at what is known as the Cecilia-street School—which is one of the minor Medical Schools in Dublin, not by any means equal to some others—but which is associated with the Catholic University College in Stephen's-green. This is an observation that is being made in Ireland, and I am assured it is the fact, and there are persons present here who know it better than I do. Dr. Starkie, for instance, has been residing in Ireland, during the last eight years that I have been over here; but that is one of the instances of squeezing out of appointments all excepting those who have completely submitted; and I am informed that students are going to the Cecilia-street School on account of its giving them the only chance that they can have of getting employment in Ireland as dispensary doctors, and no person that knows anything about the Medical Schools of Ireland—and I had a very intimate knowledge of them—can imagine that the Cecilia-street School stands anywhere, excepting several degrees lower than other Medical Schools; for instance, that of the University of Dublin. I believe that this whole policy of making questions of this kind enter into the question of whether a man is to be allowed to get an appointment is against the interests of Irishmen. It undoubtedly prevents that being done which ought to be done on every occasion, that is, to get the best available men, and provide the best medical men for attending the poor peasantry of Ireland. The whole system of dividing appointments as they are frequently divided—between Catholics and Protestants is, in my opinion corrupt. In the Intermediate Education Board, I understand from a letter I got a few days ago, they must have an equal number of Catholic and Protestant Examiners to examine the youths of Ireland. Is that the best way of getting the best Examiners? They are, I am informed, even distinguishing between Catholics and Catholics, and bringing pressure upon Catholics to force them to conform to demands which I believe, are demands that will do great mischief to my fellow countrymen.

7018. Dr. STARKIE.—I think you stated that the Queen's Colleges were condemned at the Synod of Thurles by a majority of one?—Yes.

7019. I suppose you are aware that that statement has been denied, persistently?—I was not aware of that. It was certainly not denied openly for a large number of years. The whole thing took place under my own observation.

7020. I was anxious to correct this, as the statement has been made so often. There were, in effect, two great principles adopted at the Synod: first, a reiteration of the Decree of 1847 and 1848, to the effect that the Colleges were intrinsically dangerous to the faith and morals of Catholics. I believe that that Decree was passed unanimously; but there was a second Decree forbidding the Catholic clergy under canonical censure to take any part in the administration of the Queen's Colleges.* It was that latter decree that was only passed by a majority of one. —I am greatly surprised to learn that the first Decree was passed unanimously, because it was notorious, and, indeed, evident, from the fact of Archbishop Murray's answer to Mr. Corballis, that thirteen of the Bishops remonstrated against the provisions which prevented the Catholic laity from frequenting the Queen's Colleges. And with reference to the earlier Synod you referred to, it must be remembered that in compliance with the wishes expressed there the arrangement was made by the Government that the students could live in definite houses under Deans of Residence. The critical Decree at the Synod of Thurles was not that relating to Prelates, but that withdrawing from the Catholic students in the Queen's Colleges the religious superintendence and instruction, which the Church authorities had provided for them when they appointed Deans of Residence.

7021. Professor DICKEY.—With regard to your suggestions—the second one was that the Queen's University should be revived?—Yes.

7022. And the third suggestion was that the Royal University should be continued?—Yes.

7023. Do you mean that those should be two separate Universities?—Certainly. I think the arrangement made here in London, the having two Universities mixed up together is a very bad one. I was one of the persons examined before the Gresham Commission, and in my evidence I strongly advocated having the two Universities kept distinct, and I believe it is a very bad arrangement, having the two Universities worked together.

7024. The Queen's University revived would consist of the three teaching Queen's Colleges only?—Of the three teaching Queen's Colleges only, and a system of University examinations for degrees—framed on the work of the Colleges so as to strengthen their teaching, instead of controlling it. In one of the documents that I have handed in, the way in which that was accomplished in the Queen's University is explained. The explanation is in the document, which recites the steps that were taken to try and obtain a reversal of the policy of the Act of 1879, that provided for the dissolution of the University.†

The Witness withdrew.

* See Decreta Synodi Plenariæ Episc. Hiberniæ apud Thurles. (Duffy, Dublin, 1851), p. 53, 3 and 4.

† See page 308.

ISAMBARD OWEN, Esq., M.A., M.D., F.R.C.P., Senior Deputy Chancellor of the University of Wales, examined.

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7025. Professor RHŶS.—You are a Master of Arts, a Doctor of Medicine of the University of Cambridge, a Fellow of the Royal College of Physicians, and also Senior Deputy-Chancellor of the University of Wales, and at present acting Chancellor?—Yes.

7026. Perhaps you will just explain how we come to have Deputy-Chancellors?—The supreme governing body of the University of Wales is a large public body of about a hundred members, and it was thought better, in constituting the University, that the Chairman of the University Court, which is the governing body, should be elected by the Court. We did not, therefore, take the step which is usual in most modern Universities, of making one of the academic members *ex-officio* the Chancellor's deputy. Our chief academic officer bears the title of Vice-Chancellor, but the Chancellor's place, in his absence, is taken by one of two Deputy-Chancellors, who are annually elected by the Court.

7027. You would like, perhaps, to take your own line in giving us your evidence, and the Commission would wish to know what you have to say, in your own way?—I have prepared a fairly full summary of the evidence which I propose to give, and which I might be allowed to amplify in some particulars.

7028. Yes; do just as you think best?—The University of Wales is so closely bound up with its constituent Colleges that it would be hardly intelligible to give an account of the University without saying something at the outset as to its constituent Colleges. They are three—Aberystwyth, Bangor, and Cardiff. These Colleges are all founded on the same model, and with very much the same constitution. Each consists of a Court of Governors, a Council, and a Senate. The Courts of Governors are large bodies of persons—some of whom sit by reason of benefactions made to the College. Some of them sit *ex-officio* by reason of holding public or academic posts. Others sit as nominees of the Crown, and of various public bodies in Wales. Out of the Courts of Governors are mainly chosen the Councils. The Councils, which possess independent executive powers, are mainly composed of members of the Court, elected by the Court; but they include, also, some nominees of the Crown, and some *ex-officio* members nominated by outside public authorities. The Senate is the academic body of the College, and consists of all the principal Professors and principal lecturers, or of some part of them. The exact part varies in the different Colleges. Each College receives a grant in aid from the Treasury. The University of Wales comprises four bodies—the Court, the Senate, the Guild of Graduates, and the Theological Board. The Court is the supreme governing body of the University, and nearly all the legislative and executive powers of the University are vested in the Court. It consists of a hundred members, besides the Chancellor, who are appointed as follows:—Thirteen are appointed by the Crown, 26 by the County Councils and county boroughs of Wales, 36 by the constituent Colleges, 13 by the Guild of Graduates, 3 by the head masters of the public Intermediate Schools, 3 by the head teachers of the public Elementary Schools of Wales, and 6 by the Central Welsh Board of Intermediate Education—a body constituted under the Intermediate Education Act of 1889. All the Professors and Lecturers of the Colleges who are heads of their respective departments are *ex-officio* members of the University Senate. The Senate is the advisory body, in academic matters, of the Court. The Guild of Graduates contains, not only the graduates of the University itself, but all the former students of the three Colleges who had taken degrees in other Universities before the foundation of the University of Wales. The whole teaching staff of each College are also members of the Guild of Graduates. The Theological Board is constituted, not by the Charter of the University, but by statute, and is composed partly of members nominated by the recognised Theological Colleges of Wales, and partly of members elected by the Court, the Senate, and the Guild of Graduates. As I before said, the legislative and executive powers of the University are vested by the Charter in the University Court; but the Court is debarred from legislating in reference to University studies or examinations in the secular faculties, except upon the recommendation of the Senate, or after full consideration by the Senate. The initial degrees of the University may only be conferred upon candidates who have pursued in one or other of the several constituent Colleges a scheme of study approved by the University Court. I now come to a rather important point of our system. Each of the constituent Colleges has the right of proposing its own schemes of study to the University Court for acceptance, and those schemes need not be the same in all the three Colleges, nor need the examinations based upon those schemes be the same in all three Colleges. But every scheme proposed, before it is approved by the Court, must have been considered by the University Senate, and if the Senate has not approved the scheme, the Court can only approve of it after a formal process of appeal on the part of the College concerned. Thus, we have, in fact, in the case of every scheme proposed by a single College—we have the opinion of the members of the other two Colleges upon it. In that manner we, I think I may say, succeed in maintaining a uniformly high standard of study and examinations without, at the same time, losing flexibility of scope. In the conduct of degree examinations, again, the Colleges take a part. Every examination for a degree is conducted by a Board of Examiners, of whom one is an external Examiner, not a teacher of the University at all, but an Examiner from outside the University altogether. The other members of the Board of Examiners consist of internal Examiners, one being appointed by each College that presents candidates in that subject. The external Examiner, however—and this, again, is an important point of our system—the external Examiner has an absolute veto in the Board of Examiners, and without his concurrence no degree can be conferred, and no honour can be awarded. The Vice-Chancellor, too, sits as Chairman of all the Examining Boards, so as to ensure a proper correspondence of standard in the different subjects. We regard the Colleges as an integral part of the University, although, in a strict legal sense they are not part of the University. But we always treat the Colleges as really parts of the University, and the principal officers of the College are accorded their places in all University ceremonials, and in all University meetings.

Now, with regard to Theology, that, under our Charter, is a post-graduate faculty. Every candidate who enters the Faculty of Theology must have taken a degree in Arts or in Science, either in the University of Wales, or in some other University, or some College authorised by law to grant degrees. That is, in effect, he may be a graduate of St. David's College, Lampeter.

7029. You might just say a word as to the position of Lampeter in relation to this?—I was coming to that. A candidate being either a graduate in Arts or Science must have subsequently pursued, in a Theological College recognised by the University, a scheme of study approved by the University, during not less that three years. All the Theological Colleges at present existing in Wales, including St. David's College, Lampeter, have been recognised by the University; so that a student of St. David's College, Lampeter, might take his degree in Arts in his own College, which has power to confer degrees, and might then pursue in the University of Wales his studies in Theology in his own College, and then go up for examination.

7030. St. David's College, Lampeter, is a College belonging to the Church of England?—It is. We have, as I have before said, an advisory board in Theology constituted by statute. The total number of its members is twenty-nine, and the manner of their appointment I have already entered into. That Theological Board is placed in reference to the Faculty of Theology, in precisely the same place that the University Senate has in reference to the secular faculties. That is to say, no legislation concerning schemes of study or examination in Theology can be made by the Court, except upon the recommendation of the Theological Board, or after full consideration of it by the Theological Board. The Theological Board is also asked to recommend Examiners to the University. That is a function which the Senate does not discharge in relation to the secular faculties. The curriculum in Theology which the Court has established on the advice of the Theological Board is, I may say, considered a severe one. It involves three years of very hard work after graduation in Arts or Science. The Theological Colleges in Wales have been, one by one, bringing themselves up to the standards of the requirements of the University. We have already conferred two degrees of Bachelor of Divinity, and a considerable number of students are now pursuing courses in the faculty. We also contemplate a scheme to bring the Theological

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Colleges into closer relation one with another, and with the University also.

A point of some interest in the constitution of the University is, I think, the fact that it has no narrower seat than the whole of Wales. Wales, as you are aware, is at present without a capital, and, consequently, we had no definite place in which to establish the seat of the University. We, therefore, had to de-centralise as far as possible, and make the whole working of the University equally fair to all three Colleges, and to see that all of them were placed upon a footing of complete equality. Meetings of the University Court are held, partly at the constituent Colleges, taking each of them in turn, and for the rest, wherever the University Court pleases. We have, as a matter of fact, held meetings of the Court in a considerable number of the principal towns of Wales, as a means of arousing interest in the University throughout the whole country. The meetings of the Senate likewise are held at the three Colleges in succession. My Summary is wrong there. I stated that they are held at the College of the Vice-Chancellor. That was not correct. The Vice-Chancellor's business is necessarily done at his own College, and the greater part of the academic business of the University is centred for the time being in the Vice-Chancellor's College, but the personality of the Vice-Chancellor changes every two years, and the seat of the academic business, therefore, moves from College to College every two years. The records of the University are kept, and its general business conducted at the Registrar's Office, which is at present fixed at Brecon, and that is the only approach to a local centre of the University at present. The Committees meet wherever the members find it most convenient to meet. The Guild of Graduates is given certain independent functions of its own, and it was intended to have a separate corporate life of its own. That expectation has been, to a certain extent, realised, and the Guild has, at the present time, entered upon a scheme of collective inquiry into the literature, antiquities, *flora* and *fauna* of Wales. The Guild appoints its own Warden, Treasurer, and Clerk. I have put down here in my Summary some points about the part the University is taking in the encouragement of Applied Science, but as Principal Reichel is here, I think he can give that information from more personal knowledge than I can. I will, therefore, merely add that at present the University has no power of conferring degrees in Medicine and Surgery, that it is, of course, entirely undenominational, and that it is debarred by Charter from imposing any test of opinion or creed, or any disability of sex.

7031. You have given us a clear analysis of the position and constitution of the University of Wales, and I will only ask you one or two general questions before leaving the subject. Can you tell us how far the constitution of the University has met its objects; the Commission would like to have your views upon that?—We were founded in 1893, and, so far, it appears to me that the constitution of the University has met its objects extremely well. At any rate there has been no evidence in any quarter of any desire to alter the constitution, and no serious criticism of the working of the constitution has ever been made.

7032. Have you anything to say as to the number of students at present?—There are certainly upwards of 700 students pursuing University courses in the three Colleges, besides some twenty or thirty pursuing courses of Theology in the Theological Colleges.

7033. With regard to Theology, the Commission are to understand that there is no actual teaching of it in any of the three constituent Colleges?—That is so. The three Colleges are debarred by their Charters from teaching Theology. They teach Hebrew, which is taken by many students as preparatory to the Theological course.

7034. Do you find that the University is a popular institution in Wales?—I should say so decidedly. We always appear to excite a great deal of interest in whatever town in Wales we meet. I should say it is a very popular institution.

7035. Is that popularity confined to any class of the population?—No, it is quite general.

7036. You can also tell the Commission whether any religious difficulty has ever arisen in connection with the constitution of the University?—None whatever.

7037. Or any friction in the University?—None whatever. We have never had any suggestion of it.

7038. Perhaps you would tell us briefly how the University came to exist, and how its constitution was framed?—The first College of the University that was established was at Aberystwyth. It was established by voluntary effort in 1873. The other two Colleges arose out of a Departmental Committee on Education in Wales, over which the late Lord Aberdare presided, and which was appointed in the year 1880, and both Cardiff and Bangor were opened in 1882 and 1883. The Departmental Committee that I allude to framed a recommendation in very general terms—I think, sir, you were a member of it—that it would be desirable to establish a University in Wales, and they suggested in general terms a method by which it might be done. However, nothing further was done until 1887, except that the late Principal Jones, from the time of his first arrival in Cardiff, omitted no opportunity of impressing on every one that the whole state of education in Wales logically led up to the foundation of a University. In 1887 a series of meetings, organised by the Cymmrodorion Society, were held in London at the Eisteddfod. These meetings, I may say, were public and open to any Welshman attending the Eisteddfod. At these meetings the whole subject of education in Wales was considered, and a series of resolutions were framed, including one which called for the establishment of a University in Wales in connection with the existing Colleges. The same Society called a further Conference in the following January—the January of 1888—a Conference to which the men representing the academic world of Wales alone were invited. At this Conference, among other resolutions, the desirability of the establishment of a University was again affirmed. The Conference then met the members of Parliament for Welsh constituencies, and a number of peers connected with Wales, laid the various points before them, and obtained their acquiescence to them. In the following summer, 1888, the same Society called a further meeting in connection with the National Eisteddfod, to consider the question of establishing a University. The desirability of doing so was again unanimously affirmed. I am mentioning these points, my lord, in order to show that the University of Wales, originated by a thoroughly popular movement, one that sprang from the very heart of Welsh popular life. The next step that was taken was a meeting of representatives of the three University Colleges at present associated in the University, who went as a deputation to Lord Cranbrook, then President of the Council. Lord Cranbrook invited the three Colleges to prepare a scheme and submit it to him. In the year 1891, a Conference was formed of representatives of the three Colleges and of the Conference of Intermediate Education Committees which then existed in the early days of the operation of the Intermediate Education Act. This Conference met in 1891, and laid down the general principles upon which they believed the University ought to be founded. The Conference also appointed a Committee to draw up details, and that Committee also included representatives, both academic and lay, of the three Colleges and the Intermediate Education Conference. The Committee reported a complete scheme to the Conference in the early part of 1893. The Conference adopted this scheme, and at once ordered it to be issued to every member of every County Council in Wales, to every member of every authority of the constituent Colleges, to all the members of the joint Intermediate Education Conference, and to the public, both by post and through the press. For five months the scheme was laid before the whole country in that way for consideration. At the end of five months the Conference met again, made some small alterations of detail that appeared to be required, and submitted it in the form of a draft Charter to the Privy Council. That Charter, with only some trivial changes, was approved by the Privy Council, and received the Royal assent in November, 1893. The University was constituted in the early part of the succeeding year, it framed its statutes during 1894, it commenced operations in the summer of 1895, and September, 1895, may be said to have begun our first academic year.

7038A. You mentioned a grant in aid from the Treasury. Would you be prepared to say a word or two as to the finances of the University?—Yes. Speaking in round figures, the net cost of administering the University is about £4,000 a year. That was about the sum during the last year for which we have a complete statement of the account. The actual cost of conducting the University—the gross cost of conducting the University—is between £5,000 and £6,000 a year. The resources of the University are partly the students'

fees, and partly a grant in aid which the Treasury has made to us at the commencement of each year. The grant is made upon the basis of an estimate which is submitted to the Treasury in December.

7039. Sir RICHARD JEBB.—In your very clear and comprehensive statement there was one point which I didn't quite understand, and I shall feel much obliged if you will kindly elucidate it for me. You told us that the Court cannot approve a scheme to which the Senate demurs except on appeal from the College concerned. That seems to imply that, if the College concerned does appeal, the Court may approve of a scheme to which the Senate has demurred. Have I conveyed the point to you accurately?—Yes, that is the case, but, as a matter of fact, no College as yet has appealed. The right of the Court to approve of a scheme to which the Senate demurs is guarded by statute. If a College appealed against a decision of the Senate, the Court would refer it to a special Committee appointed for the purpose. The provision was inserted in the scheme in order to avoid the possibility that a College might be aggrieved by the decision of the two other Colleges upon its scheme.

7040. Then, if the Court did refer the point to the special Committee, would the sanction of the Senate be ultimately required?—No, not upon appeal. As I have stated, there is a statute on the subject, which declares that, "On receipt by the Registrar of any appeal or notice of any appeal to the Court on the part of any College in pursuance of the second or seventh section of article xviii. of the Charter, the Registrar shall report the same to the next meeting of the Court.

7041. The next meeting of the Court?—Yes—"And the Court shall thereupon appoint a Committee of not less than five or more than eleven of its members, the Chancellor being one, with power forthwith to hear witnesses deputed by such College in support of its appeal, and persons deputed by the Senate on the contrary part, and to take such other advice as it may deem necessary, and to report accordingly to the Court with all convenient speed, and on receipt by the Court of such report, the decision of the Court upon such appeal shall be taken, with or without discussion, in the manner provided." So that the statute guards against any hasty action being taken by the Court.

7042. I ventured to ask that question, because I wish to understand clearly what the machinery is for securing uniformity of standard. It is satisfactory to learn from your evidence that that object has been attained, and I entirely accept your statement on that subject. But I do not quite understand how the machinery provided suffices for the attainment of that object, though it is, as a matter of fact, attained. Now, suppose that one of the constituent Colleges propounded a scheme of study or a scheme of examination, which appeared easier than the scheme of study or examination adopted in one or more of the other constituent Colleges, would the qualified veto of the Senate—a veto qualified by the right of the College concerned to appeal—would that qualified veto always be sufficient, do you think, to provide against the danger of too easy a scheme of examination being sanctioned by the Senate in the case of a particular College?—We believed in framing the scheme that it would, and so far our expectation has been realised.

7043. That is to say, though the schemes of examination may differ in certain respects, the general feeling in Wales is that the examinations are about equivalent in difficulty?—Yes; that is distinctly so.

7044. Professor BUTCHER.—In connection with that point you say, in the Summary of your evidence, "Each College has the right of proposing schemes of study and examination for its own students, and such schemes need not be the same for all the Colleges." Does the phrase, "examination for its own students," there, apply to the degree examinations, or only to the internal examinations carried on by the Colleges?—To the degree examinations.

7045. It does?—Yes. The degree examinations always follow the course of study the student has pursued.

7046. And I suppose the purpose of that provision was that the Colleges should have sufficient freedom of teaching?—Quite so.

7047. Because it is generally admitted, I believe, to be a danger, in the case of a federal University, that the College teaching may be somewhat cramped and hampered by too much uniformity?—Yes, decidedly. That was the danger we were anxious to guard against.

7048. I suppose you considered that very carefully in the light of the experience of other federal Universities—such, for instance, as the Victoria University?—Yes. When the scheme of the University was drawn up we had a great deal of experience before us of the working of other Universities in that respect.

7049. When you say it includes "degree examinations," do you mean examinations for Honours as well as Pass degrees?—Yes.

7050. Then the Honour examinations are not the same for all the Colleges?—Not necessarily.

7051. Not necessarily?—No.

7052. Are they, to some extent, in some subjects, the same?—In some subjects they are the same, but in others they differ rather widely.

7053. Medicine is one of your faculties, is it not?—No; only the preliminary parts.

7054. Because I feel some difficulty about applying that freedom to Medical examinations?—In Medicine there would be.

7055. What are your faculties?—Our faculties are Arts, Science, and the post-graduate Faculty of Theology. We are now considering the question of establishing a Faculty of Law. We have also a Faculty of Music. We have the power of establishing almost any faculty we please.

7056. Applied Science does not come in as a separate faculty; but have you considered the question of a Faculty of Applied Science?—So far it has been included in the Faculty of Science. I may say that in the Calendar, of which, I think, the President has a copy, the schemes of study approved for the Colleges are given, so that the Commission can see how far they are uniform or not. They are in the Appendix at the end.*

7057. Might I ask whether the courses of study on which lectures are given in the Colleges, wholly or partially correspond with the work prescribed for the degree examinations?—Entirely, as far as the University courses are concerned. We have, of course, many students in the Colleges who are not University students; but, as far as the University courses are concerned, it is the teaching in the Colleges which is approved by the University as the course for the degree.

7058. So that the teaching is with a view to that degree?—Yes, the teaching is with a view to the degree.

7059. Has a question been raised with you, which we have heard of in connection with Birmingham University, whether the work done by the students in the classes should count in the degree examination?—No; that is a question which has never been raised.

7060. You have not, yourself, considered whether that would be desirable, in order to give due weight and value to the continuous teaching work in the classes, as distinct from the mere getting up of a subject, sometimes at the last moment, for examination purposes—have you considered that?—We have never considered that subject, but I should think the danger you mention is practically guarded against in our University by the association of the teachers in the examinations.

7061. And by the fact that the actual work of the College coincides with the work for the degree?—Exactly.

7062. Another disadvantage that is sometimes found in a federal University, I have heard it said, is shifting the place of meeting. For instance, in connection with the Victoria University, some who have the experience there, say that there is a difficulty in getting all, or the proper representatives together in one centre, and that the tendency is for only those who belong to that particular centre to attend the meeting; and that there is not a complete representation of the other constituent Colleges of the University owing to this cause?—Well, we have endeavoured to provide against that by guaranteeing the travelling expenses of the members who have to attend. Of course, travelling in Wales is difficult and slow in many parts, and it often involves serious self-sacrifices to attend meetings.

7063. It is difficult, where the centres are remote, or the time taken to reach them is long—men are not under such circumstances often willing to go to meetings?—Well, so far as the meetings of the Court and of its Committees are concerned, they have been well attended. I think, however, that Dr. Reichel will be able to tell you more about it.

7064. Professor LORRAIN SMITH.—One question in regard to what Mr. Butcher has asked you as to the different courses allowed in the different Colleges, while at the same time preserving uniformity of standard. You said that special difficulties might arise in con-

* See Calendar of the University of Wales, Appendix I. Schemes and Courses of Study approved for the Degrees of B.A., B.Sc., and B. Mus. for 1901–1902.

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nection with a Medical Faculty?—In Medicine, I do not see very well how there can be any very divergent curricula, because it is a subject which is largely taught for the sake of the facts it contains——

7065. And the requirements of the General Medical Council?—Yes, it is to some extent defined by the requirements of the General Medical Council. Where you have to teach a subject for the sake of the facts which it contains it is hardly possible to have very divergent curricula.

7066. There is a certain minimum that the General Medical Council demands?—Yes.

7067. But suppose a school was specially good in Surgery, or Medicine, or some other branch of medical study, it would be quite in accordance with the principle of liberty that you have laid down that it should be allowed to develop the branch in which the members of its staff were most gifted?—I think such a school would be rather dangerous to the public if the teaching in the different branches was not developed equally.

7068. In regard to the Colleges, do they differ in constitution?—The constitution of the Colleges is almost identical.

7069. How has that arisen?—The Charters were framed, I think, very much upon the same model. I do not know where the original model of the Charters came from, but as a matter of fact, they are practically the same.

7070. Are students allowed to pass from one College to another?—Yes.

7071. Are the fees about the same?—I think, Dr. Reichel will be able to tell you more about the fees.

7072. Professor DICKEY.—With regard to the Theological Board you say it consists of twenty-nine members, and is representative?—Yes.

7073. Is it exclusively ecclesiastical?—By no means.

7074. You have laymen as well as theologians upon it?—Yes, certainly; there are a good many laymen on it.

7075. You have no provision for enforcing that a certain proportion should be lay and the other proportion ecclesiastical?—No; you understand that the constitution of the Theological Board is fixed by statute, and not by Charter, and the statutes can be altered with the consent of the Lord President of the Council.

7076. In addition to the Church of England Theological College at Lampeter, how many Colleges teach Theology in connection with the University?—There are, at present, seven Theological Colleges recognised. Whether they will all continue to teach in connection with the University one cannot say. At present it is experimental.

7077. Do they belong to different denominations?—Yes, four different denominations are represented.

7078. But they do not differ very much in Theology, do they?—I am afraid I am not sufficient of a theologian to answer your question.

7079. Has any difference or dispute ever arisen in the Theological Board?—No, there has been never any dispute or difficulty.

7080. None of those Theological Colleges participate in a State endowment of any kind?—No, none of them.

7081. They are all free, and supported by private endowment?—Yes, they are supported by private endowments or by voluntary contributions. The Nonconformist Colleges are entirely supported by voluntary effort.

7082. You said that Hebrew was taught in the constituent Colleges of the University as an Arts subject?—Yes.

7083. Can students take Hebrew as one of the subjects for an Arts degree?—Yes.

7084. Like Latin or Greek?—Yes; and a good many of them have become rather promising Hebrew scholars.

7085. Do you teach Arabic?—Yes, we teach Arabic.

7086. And Syriac?—As to Syriac, I think not; but it is open to any College to do so.

7087. But the Professor of Hebrew may teach Syriac if he wishes to do so?—It is quite open to him.

7088. Or the Professor of Hebrew might teach Arabic and Syriac also?—Yes.

7089. Is there any other Oriental language besides Hebrew and Arabic, taught in the Colleges?—Persian is taught at Aberystwyth.

7090. You have no Indian languages taught?—At present, no. Sanscrit is taught, but no modern Indian language.

The Witness withdrew.

H. R. REICHEL, Esq., M.A., LL.D., Principal of University College of North Wales, examined

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7091. Professor RHŶS.—You are Principal of the University College of North Wales, and Vice-Chancellor of the University of Wales?—Ex-Vice-Chancellor; I was Vice-Chancellor last year.

7092. You are a Master of Arts of the University of Oxford, and an honorary Doctor of Laws of the University of Glasgow?—Yes.

7093. And you were some time Fellow of All Souls College, Oxford?—Yes.

7094. We are very glad to get a man before us who knows all about the Welsh University system, as well as about Irish educational affairs generally. I think you were born in Ireland?—Yes.

7095. May I ask to what extent have you come in contact with educational questions in Ireland?—I was born in Belfast; I lived there as a boy. When I was about the age of eight I went to live at Mullingar. I was afterwards sent to school in London—to Christ's Hospital— and I got a Scholarship from Christ's Hospital to Oxford. My home was, however, in Ireland until I came to Wales, in 1884, and I always spent my vacations in Ireland. My father was Professor of Latin in the Queen's College, Belfast, until we went to Mullingar. Sometime afterwards my father became Professor of Ecclesiastical History in Trinity College, Dublin. I have had, I must say, no direct experience of Irish education, as I was educated in England; but at my home, and elsewhere, I have constantly met people interested in the subject, and I have heard a good deal about it in conversation, and, of course, I have also heard a good deal about it from my father.

7096. And you have lived a good part of your time in Ireland?—As I have said, I have spent my vacations in Ireland every year.

7097. With regard to the Welsh University, would you take your own line, and tell us what you think expedient as to the question of the establishment of that University?—I understood that Dr. Isambard Owen was going to deal with the present organisation of the University, and that I was to confine myself rather to the movement which brought it about. The first impulse to the movement for a Welsh University seems to have been given by the foundation of the Queen's University in Ireland. Government at that time refused to listen to the demand for a similar institution in Wales, and it was not until eighteen years later, in 1872, that the first secular University College was established by voluntary effort at Aberystwyth. Already, in 1865, St. David's College, Lampeter, had received power to grant the initial degrees of B.A. and B.D., but an institution intended in the main to train clergy for the Established Church could not hope to supply University training for a population the bulk of which was Nonconformist. Eight years later, in 1880, a Royal Commission on Higher and Intermediate Education in Wales reported in favour of the establishment, by Government support, of two University Colleges, one for North Wales and one for South Wales. These were opened, respectively, in 1883 at Cardiff, and in 1884 at Bangor; and in 1885 Aberystwyth was put on the same footing by receiving the full Government grant of £4,000. The Royal Commission also suggested the establishment of a University, of which the two secular Colleges of North and South Wales, and St. David's College, Lampeter, should be constituent Colleges. The University question was delayed, in the first instance, by the weakness of the Colleges which, having been established before the system of Secondary Schools, attracted comparatively few students, and those mostly ill prepared. But the idea of a federal University, comprising the University Colleges, and roughly corresponding to the old Queen's University of Ireland, was never lost sight of. It was sketched by myself, in an address, in 1885, to the Welsh National Society. The main principles were three:—(1) It was to be a teaching, and not a mere examining, University; (2) It was to comprise, in any case, the three constituent

Colleges—north, centre, and south—corresponding to Belfast, Galway, and Cork; and (3) It was to be undenominational. In 1887 the question was raised at a meeting of the Cymmrodorion Society, held in connection with the Welsh National Eisteddfod, which met that year in London, the principal movers being the present Bishop of St. David's (Dr. Owen), and the late Principal Viriamu Jones of Cardiff, and a resolution was unanimously passed in favour of the establishment of a University for Wales. In the following year a conference at Shrewsbury called upon the Welsh Members of Parliament to take action, and a meeting was, in consequence, held in London, which was attended by members of Parliament of both Houses, the Principals, and one or two Professors of the University Colleges, and a few other educationists. A fundamental difference of opinion was at once revealed: the educationists wanted a teaching University, the politicians a purely examining University on the lines of London. They argued that the University should belong to the whole country, and not to the three Colleges. This difference in principle proved a chasm that could not be bridged over, and the movement was, in consequence, postponed for several years. In 1889, the passing of the Intermediate and Technical Education Act for Wales completely altered the situation—(1) it strengthened the Colleges by the promise of a supply of better prepared students, (2) it weakened the argument for a purely examining University by bringing the extinction of the private student within measurable distance. In 1891 the question was again taken up by the Court of Governors of the University College of North Wales, when the present Bishop of St. Asaph moved and carried the following resolution:—

> "That a Committee be appointed by this Court to consider again the means of obtaining a degree-conferring University for Wales, and to deliberate upon this question with, if possible, similar Committees appointed by the Aberystwyth and Cardiff Colleges, and with the joint Education Committees of North and South Wales, and to report the result of its deliberations to the next half-yearly meeting of the Court."

The Court is the legislative authority of the University College, and consists of about 250 members. The Council is the executive authority. This led to a conference at Shrewsbury of the three Colleges and the joint Education Committees, the latter being the bodies entrusted with the duty of providing Secondary Education in the different counties. The conference appointed a Committee to draft a University Charter, after laying down two main principles—(1) That the University should be a teaching University, Collegiate training being a necessary avenue to a degree; (2) That the constituent Colleges should be, for the present, the three secular University Colleges alone—Aberystwyth, Bangor, and Cardiff.

7098. They are all residential?—All residential—that is to say, they are not residential in the sense that the students reside in the College buildings.

7099. Mr. Justice MADDEN.—But they attend courses of lectures?—Yes; in that sense they are residential. It will thus be apparent that in three years the educationists had succeeded in converting the politicians. In 1893 a draft Charter, elaborated by the Committee in frequent meetings, was accepted by the Conference, and subsequently adopted by all the County Councils in Wales with the single exception of Carnarvonshire. The Carnarvon County Council preferred a purely examining University.

7100. Professor RHŶS.—That, I believe, I might explain, was due to the influence of one or two leading politicians?—Yes, it was due to the influence of one of the leading politicians, who had strong views, which he prevailed upon the Carnarvonshire County Council to adopt. The Government of the day, on receiving the application for the grant of a University Charter, commissioned a distinguished Welsh scholar, Mr. Owen M. Edwards of Lincoln College, an old Aberystwyth student, to report on the general provision for and prospects of higher education in the Principality, and, on the receipt of his report, approved and signed the Charter submitted by the Shrewsbury Conference. There was some slight opposition in Parliament—in the Upper House, on account of the exclusion of Lampeter; in the Lower, from one or two belated partizans of an examining University.

7101. That is a very interesting question for this Commission—the admission of outsiders to be examined by any University that may be set up in Ireland. Perhaps you may have something more to say upon that point?—I regard that certainly as a vital question. When the matter came before our body, and when it was considered at a meeting of Members of Parliament and educationists in London, the view that the educationists took was this: that we should prefer to have no University to having merely an examining University, and that if we were merely to have an examining University, it would be better to go on with the London University, whose degrees bore a known value, whereas those of a small provincial examining body would have no value at all. The value of a provincial University would be largely determined by the fact that its degree connoted something more than a mere examination, viz., educational training under properly-qualified teachers, and the influence of College life.

7102. Have you at all considered the possibility of combining both; this has been touched upon with regard to Ireland, by one or more of our witnesses?—Yes; that was once before us in connection with the University of London. It was proposed at one time when we were preparing students for the degrees of the London University. The question arose whether the London University should not be made, as far as the Colleges within the Metropolis were concerned, a teaching University, while it remained an examining University for the Colleges outside. Well, we opposed that on the ground that it would be exceedingly unfair to the Colleges outside, as their students could not receive the same equal treatment with the students that came from the institutions within the metropolis, which had power to influence the course of studies and the conduct of the examinations. We also felt that if outsiders were admitted to the degree without collegiate preparation it must inevitably lower the quality of the degree, and injure, therefore, those who gained the degree after going through a proper collegiate course, because outsiders could not know whether the degree of a course implied a proper collegiate training, or whether it only indicated private study.

7103. Are you prepared to say something on the subject of the University as a federal institution, and as to the advantages and disadvantages of that system?—I have prepared some remarks on that. First as to the advantages: these are obvious. (i.) The individual Colleges in Wales are, for the present at least, hardly strong enough to exist as separate and independent Universities, though it is possible that this development may be reached in course of time; (ii.) as separate Universities, they would be more liable to injury from mutual jealousies and rivalries than as constituent Colleges of one national institution; (iii.) common action in the University bodies tends to discourage a narrow provincialism, and (iv.), most important of all, it was only by their union that the support of the Welsh national sentiment—an element of the greatest value—could be taken full advantage of. These are the advantages as they appear to me.

7104. Well, have you anything to say as to the disadvantages?—Yes. In the first place, freedom of teaching—the indispensable condition of high University activity, cannot be so great in a constituent College, as in an independent University. It may be secured, to a large extent, but it cannot be quite so unfettered. Secondly, the distance which separates the constituent Colleges is a serious obstacle, not only to administration, but also to study and research. The meetings of the joint Boards involve long and frequent railway journeys, which are a serious drain upon the time and energies of the Professors. This is a very serious drawback, and threatens, unless something can be done to mitigate it, seriously to impede the academic activity of the University.

7105. Would you now take the democratic aspect of the University?—The University Court, as has been pointed out, contains not only representatives of the constituent Colleges, which are themselves organised on a very democratic basis, but also representatives of other educational institutions of the country, and of the County Councils. The policy of including representatives of the County Councils was, at first, much debated. It was quite a new departure, and great hesitation was felt on the academic side. Ultimately, the view prevailed that their inclusion was necessary, if the full and ungrudging support of the Welsh public was to be secured, and that the keen interest and self-denial which that public had always shown in the promotion of education was the best guarantee against the possible dangers involved in the presence of a large

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and inexperienced lay element of this kind. I may say that this view has been more than justified by the actual working of the University. So far, my experience of the University Court, which is largely a democratic body, has been that it is a singularly wise body.

7106. Now as to the undenominational nature of the University—what have you got to say about that?—Well, the University is undenominational, and it is so by the logic of facts. No other system would be possible in a country where there are so many separate religious bodies and organisations. It has, however, been found possible to reconcile with this a Faculty of Theology of a high character, the studies being post-graduate, and prosecuted in the Theological Colleges of the different denominations which are recognised by the University as being adequately staffed and equipped for such study. I may add here that the recognition of these Colleges, which was spoken of by Dr. Isambard Owen, is at present only a provisional recognition, but the University has taken steps to examine into the equipment of several of these Colleges, and will very shortly, no doubt, proceed to draw up a list of recognised Colleges on the basis of the report as to their equipment and competency to deal with these studies; but at the outset all the Theological Colleges in Wales, however staffed, were recognised provisionally, the object being to give them an interest in the work, and at the same time to administer a stimulus to them to rise to their proper position.

7107. I understand that you were on a Board, or Committee, to inspect those various Colleges?—Yes.

7108. And that you had been already able to make many of them move upwards by enlarging their staff, and otherwise making themselves more efficient?—Yes; a small Committee of inspection visited all but one of these Theological Colleges within the last year or year and a half. I was on that Committee as Vice-Chancellor; the others were Professor Gwatkin of Cambridge, and Dr. Fairbairn of Oxford. We presented a very full report to the University Court on this matter—which the Court adopted unanimously—making certain recommendations as to the principles upon which the recognition of these Colleges should be based, and though no action has, so far, been taken upon it in the nature of drawing up a list of recognised Colleges, I may say that the Theological Colleges themselves have practically acted as if such a list had been drawn up, and they are themselves taking steps to improve their equipment and staffs so that they can be recognised.*

7109. Has the question of the inclusion of the Theological Colleges at all been a subject of any contention?—Yes; this inclusion of the Theology was not arrived at without much debate and hesitation. There was widespread fear, even among the friends of Theological Education, that the work of the Faculty of Theology at the outset might seriously affect the standard of the University degree, many of the Theological Colleges (in which, alone, the training could be given), being inadequately equipped for such work; and an attempt was, in consequence, made to prescribe a term of years within which the establishment of such a faculty should be prohibited. I myself took this view, and in the Court of the University College of North Wales I moved an amendment, when the question of a faculty in Theology was brought forward, that a term of seven years should be prescribed, within which it should not be competent for the University to consider the question of a Faculty of Theology, the object being to give the Theological Colleges a period, during which they might make themselves more worthy of University status. The question was, however, decided the other way. It was urged that Theology was the study which appealed most strongly to the Welsh popular mind, and that its recognition by the University would rather tend to raise and strengthen the Theological Colleges rather than to depress the standard of the University. That view has prevailed, and I am bound to admit, though I was opposed to it, has been entirely justified by the event.

7110. We now come to the question of the admission of women to higher degrees. That is one which interests this Commission. What have you to say with regard to that?—I put that down rather as a matter of College organisation.

At this stage the Commission adjourned, and on resuming,

7111. Professor RHŶS.—Before we leave the question of the Theological Board, have you any recollection of what the composition of that Board is?—Well, I have the analysis of its composition here. It consists of twelve members appointed by the University Court, of whom four are not members of the Court, but persons appointed as experts in Theology, and usually unconnected with Wales.

7112. Such as Dr. Fairbairn?—Such as Dr. Fairbairn, Principal of Mansfield College; Dr. Gwatkin, Professor of Ecclesiastical History at Cambridge; Mr. Rendell Harris of Cambridge, and Professor George Adam Smith of Glasgow. Besides these, there are six members appointed by the University Senate, who are Professors in the University Colleges. Of course, they would be generally, in the nature of things, lay members. Then, there are two members appointed by the Guild of Graduates, and a certain number of representatives appointed by the recognised Theological Colleges—nine appointed by the recognised Theological Colleges.

7113. And you say that the variety of opinion represented is very large?—Very large.

7114. My recollection of the first appointment was that it included such men as the late Marquis of Bute. I do not know whether there were any other Catholics, but there was a great variety of Theological views?—(Dr. *Owen*)—I do not think he was ever on the Theological Board.

7115. Perhaps I am wrong. He was suggested, I know; but, perhaps, he may have declined to act; I will pass on to another question. We are interested in the higher education of women: What have you to say on that subject?—(*Witness*)—I deal with that as a question of College rather than of University organisation.

7116. What is the view you take of it?—First, as to the advantages of the admission of women. Firstly, a dual College can be worked far more economically than two Colleges, and, in a poor country like Wales, if the women were not admitted to the University Colleges, their total exclusion from higher education would be the almost inevitable consequence. That is the first point. The second is that, as far as my experience goes, the dual system, if rightly managed, is productive of advantage to both sexes, having a civilising influence on the men, and promoting a more healthy tone in certain respects amongst the women.

7117. Are there any disadvantages, do you think?—Yes, undoubtedly. The dual system is, undoubtedly, more difficult to manage, and makes greater demands on the tact and judgment of the authorities. Then, the women are tempted to overtax their physical strength in competition with men. Thirdly, the interchange of opinion in students' societies, which forms so important an element in the intellectual life of a College, is apt to be less free and unconstrained than when the membership is confined to either sex.

7118. But, on the whole, what is your opinion?—On the whole, my experience is in favour of the dual system, which is already established in our Secondary Schools, and which should work better when it is continued right up from the Elementary Schools through the Secondary Schools into the University classes. When once it comes to be regarded as perfectly natural, the initial difficulties will largely disappear. I may add that the difficulties that I have indicated may be got over in some measure—or, at all events, mitigated—first, by provision for the women students living in a hostel or hall of residence under proper supervision, but for which they are apt to over-work themselves, and not to take proper care of their health; and, secondly, by allowing considerable freedom of choice as to the course of study. Courses of study that suit men are often not equally suitable for women. Their tastes and capabilities often lie in different directions. Might I say, before leaving this point, that the exclusion of women would not merely involve financial difficulty, but, as far as my observation has gone, it would mean a serious blow to the whole educational movement, as far as intellectual interest was concerned, because the women are the future mothers of the race, and if their influence is against intellectual life in the home, it must seriously impede the development of intellectual life in the nation.

* See page 302.

7119. To go on to another subject it has been mentioned to us that something should be done to facilitate the taking of degrees by teachers in Ireland. Have you anything to say in regard to that in your organisation—in connection with the organisation of the Welsh University?—Do you mean teachers of Secondary Schools or of Elementary Schools?

7120. Well, it would be desirable that a great many of the teachers especially in Secondary Schools should be able to take their degree, that they should have some opportunities of studying, and finally take their degree. I do not know that it should be confined to teachers in Secondary Schools; possibly it might reach lower down. You have a Normal department?—We have a Normal department. One takes it for granted that the teachers in the Secondary Schools should have had a University training, and hold, if possible, a University degree. I fail to see how any system of Secondary teaching could be really efficient in which the bulk of the teachers had not been through a University training. A very large proportion of our students, both men and women, are pursuing their studies at College with that professional end in view—viz., becoming teachers in Secondary Schools. But, in addition to this, we have what is called a Day Training Department for Elementary teachers, men and women. This Day Training Department is one, in my judgment, in which some of the best work of the University Colleges is accomplished. The system is Welsh in origin, having been first sketched out by the late Principal of Cardiff, Principal Viriamu Jones, and adopted, on his suggestion by the Education Department. Normal students are admitted in a number fixed by agreement with the Board of Education. They do their academical work in the ordinary classes of the University College, the professional work being provided for by a special staff of lecturers, whose salaries are paid out of a direct grant from the Board of Education. They have thus the advantage of mixing, during their College course, with students preparing for other professions, and the best of them are able to graduate after a course of study in the higher classes. Fears were at first entertained that the admission of a large number of students whose previous experience of education had been confined almost entirely to the Elementary Schools, might have an injurious effect on the general standard of the College work, but this danger has been largely obviated, partly by the creation in the department itself of junior classes in the academical subjects for the weaker students, and partly by the steady improvement in the quality of the students admitted. This improvement has resulted from the attraction of the advantages offered by the College and the University, as compared with the residential Colleges, and also, and still more, from the operation of the policy now being widely adopted by the Elementary School authorities in Wales of sending their pupil teachers for several years to one of the new Intermediate County Schools—that is, the Secondary Schools. When the Day Training Department was first opened at Bangor, none of the Normal students admitted had been educated at a Secondary School. At the beginning of the present session, out of forty-eight new Normal students, twenty-six had spent three years or more in a Secondary School, and it may reasonably be expected that within a few years every student admitted will have this qualification. The main defect of the system is that the students are somewhat overloaded with work, and have to pursue the academical and the professional work side by side. Where the academical work is degree work it is sufficient to take up the whole of the time of the average student. But the policy recently adopted by the Board of Education of allowing a freer hand to the Training Colleges ought to make it possible to establish before long a more reasonable and less exacting curriculum. I may add, in connection with this, that we have, within the last session, established a special third year's course in agricultural subjects for students who are intending to teach in country schools. A student who has passed through the ordinary two years' training is allowed, by special grant of the Board of Education, to stay for this third year's course in order to acquaint himself with subjects bearing upon country life.

7121. That leads me on to your technical departments, and especially that connected with Agriculture. What have you to say on that?—We have two technical departments, at present, in the College—Agriculture and Electrical Engineering—and we contemplate the establishment of a third—Mining. The Agricultural department was originally initiated by the University College of North Wales, just as the Normal department was initiated by the University College of South Wales, and the agricultural departments now worked in connection with several of the English University Colleges were borrowed from the original scheme planned by the University College of Bangor, and accepted by the Board of Agriculture. The Agricultural department embraces two kinds of work—first, extension work, lectures, field experiments, travelling dairy work, and so on, in the various counties of North Wales. This is, in the main, for adults, and is intended rather to supply useful information than education. It is paid for by the technical grants of the County Councils of Anglesey, Carnarvon, Denbigh, Flint, and Montgomery, which grants amount in the aggregate to nearly £1,200. The second kind of work embraced by the agricultural department is the in-College work for sons of farmers and others of College age. This is intended to supply not merely useful information with regard to the agricultural industry, but also a sound training in those branches of Science whose principles are involved in farming operations. A student may take a three years' course for the degree of the University of Wales in the agricultural group of sciences, or a more technical course for the College diploma in Agriculture, which extends over two years. The degree course would be rather for a man who was going to be a teacher in an Agricultural School or College, and the diploma course for one who was going into active work, who was going to be an estate bailiff, or something of that kind. In addition to these extended courses, there is a short winter course for the sons of farmers, which lasts for eleven weeks. This is intended to give an elementary training to lads actually engaged in farm work during the season in which their services on the farm are least required. The work done in this short course I regard as specially valuable. The type of student who comes to it is distinctly good, and he goes straight back from the College classes to the farm. A few of the best come back for the longer diploma course. The whole cost of the in-College work, and most of the office and organising expenses for the out-College work are provided by an annual grant from the Board of Agriculture of £800. I may add that a College farm, an experimental and educational farm station, has been recently established.

7122. Will you tell us something about that?—Three years ago we took one of the best farms in Anglesey for the purposes of an experimental and educational station. The Board of Agriculture gives an annual grant for its maintenance of £200. Systematic experiments are conducted upon it, and the students visit it frequently for purposes of instruction. The Department has, in my opinion, had a considerable effect in encouraging the agricultural population throughout North Wales to believe in the application of improved methods, &c., but, at the same time, it cannot, I think, have any profound effect until it is supplemented by some commercial organisation of a co-operative character, which will enable the individual farmer to take advantage of distant markets. The Danish system of Agricultural Education, which has had such remarkable success, could never have transformed the Danish agricultural industry had it not been supplemented by a no less highly organised system of co-operation, and I do not think that, until something like the Irish co-operative movement, started by Mr. Plunkett, is extended to Wales, the agricultural departments of the Welsh University Colleges will be able to exert their full force.

7123. You have studied that scheme of Mr. Plunkett's, have you?—Yes, but not in detail. I know the main principles of it.

7124. Have you any further remarks to make upon it?—No, I think not. The difficulty is this:—Say a farmer takes advantage of some lectures, or gets his daughter trained at a Dairy School. He then finds that he is not in a position to take advantage of the high prices for really good butter which can be obtained at suitable centres, but not in the immediate neighbourhood of his farm. If he sends his butter away from the farm by train, the advantages are immediately lost in railway freights. Unless there is some system of co-operation, which will enable him to put his produce in the market in an economical way, we cannot hold out to him much prospect of bettering himself by Agricultural Education.

7125. Now we come to the other technical departments?—The next is the Electrical Engineering department.

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7126. Yes?—This is a technical branch of the Physics department. It was started a few years ago by the Professor of Physics, Dr. Gray (who has since succeeded Lord Kelvin at Glasgow), and the course corresponds in idea to the two years' diploma course of the Agricultural department.

7127. You are now speaking of the University College of North Wales?—Of the University College of North Wales solely. The object is to give a thorough theoretical and practical training to young men who desire to get positions in electrical engineering works. Two years ago, in consequence of the increase of the work, it became necessary to appoint a special assistant to take charge of this sub-department, and a temporary grant was made by the Drapers' Company for its maintenance for a period of three years, pending the securing by the College of a more permanent provision.

7128. Do you know at all what has been done in the same direction at the other two Colleges?—Nothing has been done at Aberystwyth. I think that from the first they have had a department of this kind at Cardiff, but I am not acquainted with the details.

7129. Now, with regard to the Mining department?—A movement is at present on foot for the establishment, with the aid of the technical authorities of North Wales of a Mining department similar to those existing at Cardiff, Newcastle-on-Tyne, and elsewhere. If the scheme is carried out it will involve a capital expenditure of about £8,000, to be raised by subscriptions, and an annual expenditure of some £1,200, to be provided out of the technical rate. The mining and quarrying industry is only second in importance to agriculture in North Wales, and if the provision for scientific training in connection with the great industries of the district is to be regarded as an important function of a provincial University College, there can be no question of the urgent need of such a department. Speaking generally, with regard to technical work, I regard the development of technical departments of this character as of the highest importance for the public well-being wherever a University College may be situated, inasmuch as the University College provides the best organisation for bringing Science to bear on the local industries. At the same time, it seems to me specially important where a College draws its students mostly from a Celtic district.

7130. Will you develop that?—The best of the English mind, as far as I have observed, is mainly practical, and the difficulty is to get an English student to interest himself in Literature or in any purely theoretical study. The natural bent, on the other hand, of the Welshman and the Irishman alike is towards literary expression, and in default of some special inducement he is in danger of neglecting the application of knowledge, especially of scientific knowledge, to practical life. If the operation of University institutions in Wales and in Ireland is not to be the mere production in excessive numbers of Arts graduates, unfit for any but the over-stocked literary professions, it is, I think, imperatively necessary that technical studies of an advanced character should form an important and an attractive part of their curriculum.

7131. Sir RICHARD JEBB.—Professor Reichel, in your interesting evidence, you refer to residence as one of the conditions?—Yes.

7132. The meaning of residence, as I understand it, is that a student, if he attends lectures given at a College, may reside where he pleases?—Yes. In our own College we license lodgings.

7133. Under rules?—Our Charter, I think, is different from those of Aberystwyth and Cardiff. Our Charter absolutely forbids the students to live inside the College buildings. That provision was specially put in to avoid the denominational difficulty.

7134. But, as at Oxford and Cambridge, you license lodgings?—We license lodgings very much on the same lodgings' regulations which prevail at Oxford. We have, however, a hall of residence for our women students, and we require all women students under twenty-one years of age to reside in it. At the other Colleges, I believe, they require all women students, whatever their age, unless they are living with parents or near relations, to live in the College hall.

7135. Would it be possible for you to state approximately the cost per year of living of a student during his University course, and the amount of University fees that he has to pay?—Quite easily. With us, the composition fee for an Arts course is £10, and there is a registration fee of one guinea—practically £11, you may say. If a student takes Science it comes to about £15 for the year. The cost of a student in lodgings would be from £20 to £30 for the year of thirty-two weeks.

7136. So that he could do the whole for something under £50 for the year?—Oh, yes, easily.

7137. Are you aware of the extent of demand in Wales for a provision under which students who have not fulfilled residence at one of the constituent Colleges should be admitted to the examinations of the University in Wales?—I think that such a demand has entirely ceased. The fact is that with us the private student is an extinct animal.

7138. Or if he be not absolutely extinct, if any specimens survive, they, I suppose, would have recourse to the University of London, probably?—That is always open to them, yes.

7139. I suppose that no large number of students resident in Wales now go in for the University of London examinations as external students?—Not many.

7140. You mentioned, as one of the disadvantages of the federal University system, restricted freedom of teaching for each constituent College. Now, take a literary subject, such as the ancient Classics. Could you give us some idea of the extent and nature of the restriction in regard to such a subject? I mention that only as an example; any literary subject would serve equally well.—Well, the restriction is not great, and it operates in this way. It saves trouble if the same departments, in the three Colleges, can, as far as possible, agree upon the same course. There is always a certain pressure upon the Professors of Greek, *e.g.*, in the three Colleges to select the same books, merely for the saving of trouble. They are not obliged to do so, but they themselves feel the pressure, and to that extent—and, I may say, to that extent alone—there is a certain restriction of the freedom of teaching. At the same time, I am bound to say that the restriction is very slight.

7142. Do you suppose that there is any relation between that restriction, such as it is, and the question of maintaining a uniform standard of examination as between the different Colleges?—I do not think it operates so much in that way. No; I think not. I think it is that the Professors—who, it must be remembered, are all internal Examiners (the head of each department in the individual College being an internal Examiner for the University in connection with an external Examiner appointed by the University)—feels that the work of examining is simplified, not only for the external Examiner, but for himself, if the courses correspond as far as possible.

7143. You referred, also, to the disadvantage arising from the distance between the constituent Colleges—the geographical difficulty—and you rather suggested, I think, that it might possibly be contemplated to adopt some means of diminishing that disadvantage. Did I rightly understand that?—I did not mean to suggest that we had at present in view any means by which it might be diminished, but that one hoped that some means might be discovered.

7144. Have you any ideas yourself as to how it might be done?—Beyond that of endeavouring to restrict the number of academical persons who would be affected by this travelling, I have not.

7145. In a very interesting part of your evidence you referred to the advantage which the University of Wales in its present form derived from the support of Welsh national sentiment. But you also indicated the possibility that in future the three constituent Colleges, or some of them, might develop into separate Universities?—Yes.

7146. Now, in the case of Victoria University, that, as you are aware, is occurring. Liverpool has already determined to become a separate University; Manchester appears to be on the threshold of doing so; and Leeds also contemplates that step, though perhaps it might have preferred the federal system to continue. Now, there is this obvious difference between the University of Wales and the case of Victoria University. In the case of Victoria University the three constituent Colleges are located in large cities. That description, I suppose, could hardly be applied to the towns in which the constituent Colleges of the Welsh University are situated?—With the exception of Cardiff.

7147. That, of course, is an exception?—Yes.

7148. What would be, approximately, the present population of Cardiff—I do not ask for the exact figures?—I would say about 200,000—perhaps more.

7149. Now, do you think, if such a transformation were ultimately to occur in Wales, the urban sentiment, which will support the Universities of Liverpool, Manchester, and Leeds, respectively, could be expected to manifest itself in the case of the Welsh seats?—In the case of Cardiff, yes. There is a powerful city there. In the cases of Bangor and Aberystwyth, the town in which the College happens to be situate is merely a location. My own College is the College of North Wales. In fact, the question of location has actually been raised. The question whether the College shall continue at Bangor has, at the present moment, actually arisen, owing to the difficulty of securing a site for permanent buildings. The support of a small town of 10,000 or 12,000 inhabitants would, of course, not be adequate for the maintenance of a University or University College. But in a very real sense the University College is felt to be the College of the whole of North Wales. The Court of Governors is representative quite as much of the other towns as of Bangor, and a considerable proportion of the meetings are held away from Bangor, so as to give the representatives of the other districts an equal chance of attending to College business.

7150. The last question I wish to ask is a general one, to which a definite answer can hardly be expected; but I think it would be interesting to all of us to hear your impression on this subject. You are intimately acquainted with Ireland, as well as with Wales. Could you institute any general comparison between the two countries with regard to the desire for higher education —for University Education—in those classes which would be especially benefited by an extension of University Education in Ireland?—I am afraid I could not answer that question.

7151. CHAIRMAN.—I understand, if I may intervene, that you have not studied the evidence which has been given before the Commission?—No; I have not studied the evidence.

7152. And I rather gather that you would prefer to defer any explanation of your views in that relation? —I think that would be better; I think I should be in a better position to give a definite answer to the question when I have read that evidence.

7153. Sir RICHARD JEBB.—Then might I ask a question relating only to Wales? Do you think that the influence of the University of Wales in the Principality at large has been to diffuse a desire for University Education in a downward direction; that is to say, to spread it among classes who did not feel that desire when the University was first established?—Distinctly; I think so, certainly. But the feeling was so strong originally, whatever the causes may be—the desire for University Education has always been so widespread in Wales that I should hesitate to say that it had spread any further. One of the most extraordinary features about Welsh social life is the desire for University Education, penetrating to the very lowest classes When our College at Bangor was established, long before the University came into existence, there was a public subscription to form an endowment for it. I believe it is true to say that the number of people who subscribed was larger than the number who had subscribed to any public object of the kind then on record—at least, on record in this country. Out of £30,000, a sum of over £1,200 was subscribed in two quarries by the quarrymen—in the Penrhyn quarry at Bethesda, and the Llanberis quarry.

7154. Professor BUTCHER.—May I ask you to go back for a moment to the question of the extinction of the private or non-collegiate student? Could you give us some idea of the steps or stages by which this person became extinct, and the causes?—He became extinct, upon the organisation of our system of Secondary Education.

7155. Would you explain that a little?—We have a system of Secondary Education which is based on the idea that a Secondary Day School should be within reach of every family in Wales. I do not say that that object has been absolutely attained, but it has been very nearly attained. As a result of this there are rather over ninety Secondary Day Schools in Wales. In my own county of Carnarvon there are eight or nine —nine, I think. Not only do these schools exist, but there is a system of county Scholarships which bring on the cleverest boys and girls from the Elementary Schools into the Secondary Schools, and there are so many of these that it is practically certain that no child of any real capacity who gets into an Elementary School can fail to be carried on to a Secondary School without charge to his parents. Then, when they have passed through the Secondary Schools, there are County Exhibitions, as they are called, which carry them on to the University Colleges, besides the possibility of winning Scholarships at the University Colleges themselves. The result is that the early talent of the country is swept into the system; it is a very large net with very small meshes, and practically nothing that is worth capture escapes.

7156. Have you any idea of the total sums that are employed, say, in relation to your own College, for such a purpose as helping on the boys and girls of the Secondary Schools?—Well, in my own county of Carnarvonshire they give, every year, five Exhibitions of £20 a year for three years. The County Governing Body gives that. The County Governing Body is the county authority which controls the Secondary Schools in the county, and appoints the headmasters, and it largely corresponds to the proposed local authority under the English Education Bill. In fact, that local authority was no doubt suggested by the County Governing Body of the Welsh system.

7157. It is a condition, I suppose, in the Intermediate and Secondary Schools, of getting any prize or Exhibition, that you should attend some recognised place of teaching—some recognised school or College?—Yes.

7158. You cannot simply put the money in your pocket and apply it to other purposes?—No. When they are granted, they can be held at one of the national Colleges, or at some other place of University or higher technical training, approved by the County Governing Body. They are only tenable on such residence.

7159. Some such system as is carried out in the reformed Intermediate Education system for Ireland?—That I do not know.

7160. Mr. Justice MADDEN.—Yes, such a principle has been adopted. As I understand, the funds for the Scholarships are supplied by the locality?—Yes, the Scholarships are in the hands of the County Governing Body, but the fund is supplied partly by a local rate—a halfpenny rate—and partly by an equal Government grant, and, in most of the Welsh counties, also by what is called the liquor money, which most of them hand over for the Intermediate Schools.

7161. Professor BUTCHER.—So that you have a pretty large number of students who really can almost live in your College on the Exhibitions from school, or the prizes?—Yes, a considerable number; I could not give the number exactly.

7162. But a considerable number?—A considerable number, undoubtedly.

7163. Is is true that they are enabled to come to College instead of passing the examinations of an examining University?—I think it is, to a large extent.

7164. Used many of them to go in for the London degree before you had your University?—Yes, because having then no degree of our own we held our classes with a view to the degrees of the London University.

7165. And do you feel far more unfettered in your work now that you are not obliged to teach with a view to a degree outside?—Immeasurably; it is a difference of kind rather than degree.

7166. To go back again, now, to the question of the degree examination, I wish to ask one or two questions a little more in detail. I rather gather from a hasty inspection of your Calendar that the different subjects are somewhat differently treated; that in some subjects there are common papers for all three Colleges, and in some subjects there are papers partly common and partly special. I was wondering how that works out exactly as regards the maintenance of standard. If I am right in the impression I received, it would seem that in Greek and Latin, for instance, there are certain courses in common for all three Colleges, and that other courses, even for the ordinary degree, are different —that Bangor and Cardiff have one set of books, and Aberystwyth another?—Yes.

7167. That is as regards the ordinary degree. Then, as regards Honours, if I understand it rightly, all the papers are really in common, but there are considerable options?—That is so.

7168. Is not that the way it works out?—Yes.

7169. And I suppose that where you set common papers for all the Colleges, you have rather to depend upon the allowance of optional questions, so as to give the necessary freedom to each College. Well, in Pure Mathematics—if I am right—again, in Physics, in Chemistry, in Biology, in Botany, I think in Zoology, but not in Geology—in all those subjects there seem to be common books or subjects set; certainly, in Pure Mathematics it is so. But I suppose you can set

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papers with so many alternative optional questions as to secure the end you are speaking of?—That is the way in which it is usually done.

7170. In Philosophy again, I find that all the ordinary subjects for the degree—in Logic, in Psychology, in Ethics—are common to all three Colleges, and that in Honours, on the other hand, there are some special courses for each College?—Yes.

7171. I need not go through them further; but that gives me the sort of general principle on which you work. And, as a security, or securities, for uniformity of standard, what would you point to and emphasize?—The system of our Examining Boards. The Examining Board in any subject has one External Examiner, appointed by the University, and one Internal Examiner, appointed by each constituent College, and the External Examiner has an absolute veto on the passing of any candidate.

7172. So that he can out-weigh, or out-vote the other three, if necessary?—Entirely. But each Internal Examiner does not look over all the papers. He is supposed to look over his own papers, and then send them on to the External Examiner. The External Examiner marks them, and then he distributes those papers—but merely for information—between the other two Internal Examiners.

7173. Sir RICHARD JEBB.—Does the External Examiner see all the papers?—The External Examiner sees every paper, and no candidate can pass without his approbation. He has an absolute veto on the passing of every candidate; that is secured by Charter. The External Examiner, after looking over the papers he has received from a particular College, say, College A, sends them on to Colleges B and C, dividing them up; but this is rather for purposes of information, in order that the Internal Examiner may ascertain the kind of work that has been done at the other Colleges. In the case of papers which he thinks doubtful he marks them doubtful, and then the duty is laid on the Examiner of the other College to which he sends that particular paper, to look it over carefully, and to estimate it for examination purposes.

7174. Professor BUTCHER.—In estimating this doubtful work, is it customary to take into account work which has been done in the course of the term?—That would come up in this way. At the final meeting of the Board the External Examiner would say that he regarded such and such cases as doubtful. Then the report of the Internal Examiner of the College would be heard; he would say what he thought. Then, if both were doubtful, they would gather what the assessing Examiner of College C had to say. If there was still doubt about it, the Internal Examiner of the College would be asked what was his report on the work of the session. If that was strongly favourable, it would turn the scale; if it was unfavourable, it would also turn the scale in the other direction.

7175. That seems an adequate safeguard for the standard of the examination. Then there is the other question, which has been already mentioned, of the ratification of proposed schemes of study, and examinations and books. I read in your Charter, Sec. 18, Sub-Sec. 3, of what seems to be a sort of suspensory veto which resides in the Senate, but which you, I understand, have not ever yet had occasion to call into play?—Never.

7176. Have you thought it out in detail at all?—I think that this suspension for six months simply means that some answer, within a definite time, must be expected from the Senate. If they have not given an approval in that time, it must be assumed that their reply is unfavourable. But as far as my observation of the working of the system in the Senate is concerned, I should not think there was the remotest chance of a scheme which was beneath the other two schemes in difficulty passing through the Senate, or of the University Court looking at it for a moment on the petition of the third College. The University Court is exceedingly jealous of the standard of its degree. I have noticed that whenever there has been a question involving the standard of the degree, the University Court has always taken the higher view. That explains what I have said before, that I have come to regard the University Court as a very wise body.

7177. Dr. STARKIE.—I have just one question to ask you, Professor Reichel. I was much interested in what you said about the organisation of Secondary Education in Wales, and the means by which you have co-ordinated it with the primary system. You told us, I think, that in the Principality there were ninety Secondary Schools?—Yes.

7178. And that they were located in such a way that there was a Secondary School within reach of every family?—Yes.

7179. What, exactly, do you mean by saying that a Secondary School is within reach of every family?—Of course, that is a general phrase; I do not mean to say that it is absolutely true. But approximately it is true, that every family has a Secondary School near enough to be attended as a day school.

7180. In the case of Primary Education in Ireland—when we speak of a school being near a family we mean that it is within two miles; but, of course, your schools are, sometimes, a good deal further than that?—Yes.

7181. Ireland is much larger than Wales; and it has been found necessary to endow, or to give grants to something like 9,000 Primary Schools, so as to provide facilities within two miles of every child?—But the test is this: that in connection with extremely few schools have lodging-house arrangements been made for pupils who have to live away from home, though every scheme contains power for the creation of such lodging-houses.

7182. I can congratulate you, I think, on the admirable way in which you have solved the immense difficulty of the co-ordination of Secondary and Primary Education?—Of course, a good many pupils have to come in by train every morning; that must be remembered.

7183. I was also interested in what you said about county Scholarships, and, in fact, in the way in which you, in the Principality, have provided a ladder reaching from the Primary Schools to the University. You said there were a certain number of county Scholarships given every year, which were open to the best students from the Secondary Schools. With regard to those students, I should be glad to know whether many of them, as I think you suggested, earlier in your evidence, become Elementary School teachers?—I cannot give you any figures on the subject; but I should say that the tendency would be for a large number of them to become Elementary School teachers because many of the School Boards are now adopting the system of sending their pupil-teachers on to the Secondary Schools for three years.

7184. At what age?—At thirteen or fourteen.

7185. Pupil-teachers are what we call monitors in Ireland, I think?—Yes.

7186. That is the age for a monitor, in Ireland. At from thirteen to sixteen they can be appointed?—Yes.

7187. What service can a pupil teacher give in a school, or why should he be called a pupil-teacher, if he spends the whole of his time in a Secondary School?—He does not spend the whole of his time in a Secondary School. He spends the early part of his time in the Secondary School; he is really not a full pupil teacher, but a probationary pupil teacher.

7188. Does he go back to the Elementary School before he enters the Training College?—He goes back to the Elementary School for two years, and then goes on to the Training College.

7189. He comes on to you at about eighteen or nineteen years of age, I suppose?—At eighteen or nineteen.

7190. How many years does he pass in the Training College—two years, I suppose, as in Ireland?—Two years in any case; but in the case of those who are going to study for a degree, or to take a special course in Agriculture, three years. The Board of Education allows all Normal students, who are in degree classes, and making progress in them, to stay a third year.

7191. And the Board of Agriculture make a grant for students in the third year?—Yes.*

7192. I may say that they are more liberal than we are. The Treasury have never allowed us to allow more than two years at the Training College. But you think it is eminently desirable that teachers who are likely to get the best schools should be encouraged to take a University degree?—Undoubtedly.

7193. And liberalised as far as possible?—And liberalise, as far as possible, the atmosphere of the Elementary Schools. It seems to me that we are rapidly approaching the ideal system, in which the future elementary teachers should have had experience of the three grades of schools—Elementary, Secondary, and University.

7194. In examining a witness in Dublin, I suggested something of that kind, being influenced entirely by my own experience in Ireland, and, as it happened, I

* This is a mistake. I understood the question to be "The Board of Education make a grant, &c."—H. R. R.

was not aware that the Welsh had actually carried out what I had merely sketched. From that point of view, I think it is very important. I suppose, then, you can say that in Wales Primary, Secondary, and University Education are really better co-ordinated, and more highly developed, and approach more nearly to the ideal that we all set before us, than is the case either in England or in Scotland?—I will not say than Scotland, but certainly than England. The fact is that we have a uniform system in Wales, while of system in England there is apparently none. It may be created, but at present it does not exist.

7195. I have heard applied to England words with which I am not unfamiliar in Ireland—that Primary and Secondary Education in England are in a state of chaos?—Secondary Education is, certainly.

7196. Professor LORRAIN SMITH.—In regard to the bond of connection between the Colleges and the University I am not quite clear, in my mind. In what sense is a constituent College connected with the University?—No student can sit for the degree examination except as a student of one of the constituent Colleges. The Senate of the University is composed of the heads of the departments in the constituent Colleges. The Principals of the constituent Colleges are, in rotation, Vice-Chancellors of the University. The University Court has thirty-six members out of something over 100, who are elected by the constituent Colleges.

7197. And now with regard to the Colleges which you regard as Colleges which you may possibly recognise?—You mean the Theological Colleges?

7198. Yes, the Theological Colleges. Would you recognise those as constituent Colleges?—No. A recognised College is so only in connection with one faculty. A Theological College has the right only to present students in the one Faculty of Theology, and its teaching is recognised only in that faculty. They have representation on a body which corresponds to the University Senate, namely, the Board of Theology; but they have not exclusive representation on that. On the University Senate, which is the academical body for the other faculties, only the Professors of the constituent Colleges have seats. On the Board of Theology, besides the Professors of the recognised Theological Colleges, there are other members appointed by the University Court, and members appointed by the University Senate.

7199. And what is their relation to the Court?—They do not elect representatives to the University Court.

7200. So that you have two grades, then, of recognition—the collegiate schools, and the strictly recognised College?—Yes.

7201. Do you recognise teachers as they do in the new London University?—No. The teachers of the constituent Colleges are *ex-officio* University teachers, but we do not recognise anybody else.

7202. Quite so; but I meant a third body, in which, perhaps, a single teacher was recognised?—No, we have nothing of that.

The Witness withdrew.

The Right Rev Monsignor MERCIER, Professor in the Faculty of Philosophy and Literature, and President of the "Institut Supérieur de Philosophie," in the University of Louvain, examined.

7203. The Most Rev. Dr. HEALY.—Monsignor Mercier, you are Dean and Professor in the Faculty of Philosophy and Letters at Louvain?—Yes.

Right Rev. Monsignor Mercier.

7204. And I believe you are also President or Head of the Institute of St. Thomas' School of Higher Philosophy, as I gather from this sketch, which you have handed in, which appears to have been instituted for the purpose of studying St. Thomas in relation especially to modern scientific developments. Am I right in that?—Just so.

7205. Both in the matter of Physical Science and Social and Political Science?—Yes, Physical, Political, and Social Science.

7206. I understand that you have written in the English language, for which, I think, we are all obliged to you, the substance of the information which you propose to submit to the Commissioners, and, perhaps, the best plan would be for you to follow the order which you have indicated in the sketch before us, and then, if, from time to time, I have to put to you a brief question, I hope it will not interfere with you?—Very good. I will read what I have to say on the first point.

7207. Your first point deals with the history of the University of Louvain?—Of course, this first point will be very brief. It is merely an allusion to the ancient University of Louvain. The ancient University of Louvain was founded in 1425; the Duke of Brabant, John IV., requested its foundation from Pope Martin V. It comprised four faculties—the Faculties of Theology, Law (Canon and Civil), Medicine, and Arts, which last comprised Philosophy, Letters, Sciences, Physics, and Mathematics. With the exception of certain rights, especially those reserved to the Holy See, the University constituted a government in itself. It had the power of determining its own programmes and possessed its own revenues. The nomination of the Professors belonged to the Commune which paid them. However, the liberty of this choice was later on, to some extent, restricted. In the eighteenth century the University had lost a good deal of its ancient splendour; however, it still possessed fifty-eight Professors, forty-three Colleges, and 3,000 students. In 1797, the University was suppressed. The reason alleged to justify this suppression was that, "the University of Louvain, by its form, and the character of the subjects taught, was not in accordance with the system of public instruction which the Republican principles required." The halls of the University were closed, and the revenues confiscated. I have in a little appendix a short sketch of the names of the principal Professors of the old University. Perhaps it would be too long to read all these names, but I will put the list at the disposal of the Commission.*

7208. Perhaps you would hand in that paper to the Secretary?—Very good. The Belgian Constitution of 1831 decreed the liberty of teaching. In 1833, the Belgian Bishops took the bold resolution of founding a free Catholic University. The Apostolic Constitution of Pope Gregory XVI. was given to the Bishops on the 8th of April, 1834, and published by them on the 10th of June, 1834. From the beginning, the University comprised five faculties—Divinity, Law, Medicine, Philosophy and Letters, Sciences (Mathematical, Physical, and Natural). Let us observe, by the way, that, in June, 1834, at a meeting of Liberals (that is a name we give in Belgium to those who are neutral or secular), held in Brussels, the idea was put forth of founding another free University, which was called at first "Free University of Belgium," and afterwards, in 1842, "Free University of Brussels." Furthermore, two other Universities were established by the Government, one at Ghent, the other at Liege. So we have, at present, four Universities in Belgium, two free (one Catholic, and the other Liberal), and two are secular and undenominational Universities of the State. Five faculties exist at Louvain up to the present, and form the framework of the University. The law of April 10th, 1890, to which higher education in Belgium is actually subject, recognises as Universities only those institutions that possess four faculties, namely, the Faculties of Science, Medicine, Law, and Arts. The free Universities as well as the State Universities have the power of conferring degrees. Careers are open to the pupils of the free just as well as to those of the State Universities. The law of April 10th, 1890, leaves the free Universities in perfect liberty with regard to the keeping up of their professorial staff, but it withholds the right of legalising the diplomas conferred by the Universities, and subjects this legalisation to certain conditions, of which the two principal are the following. (Upon this point I shall not dwell, as my colleague will say more on it):—(1.) Before admission to the University, the student must have made, with success, a complete course of Humanities. (2.) The law determines for every degree a minimum of subjects on which the pupil must be examined. But each University adds to this programme minimum at its convenience. We shall see, further on, in the chapter on "Scientific Life at Louvain," how amply the Catholic University has availed itself of this permission granted by the law. My colleague, Mr. Nerincx, will point out the exact relations existing between the University and the civil authorities—namely, the Government and the Com-

* See page 312.

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munie. I propose to indicate its relations with ecclesiastical authority. Before doing so, I beg to remark that, according to the University statutes:—(Art. 6.) The ordinary Professors of each faculty elect by vote their Dean and Secretary; (Art. 7.) In their meetings, which take place every month, the Professors discuss the interests of the faculty, and determine the programme of courses, which programme is subject to the approbation of the Rector; (Art. 8.) The Deans of the faculties, together with the Rector, Vice-Rector, and Secretary of the University, form what we call the "Conseil Rectoral"; (Art. 10.) All the Professors assembled under the presidentship of the Rector, form what we call the "Senat Academique." Now, I come to the second point.

7209. Have you anything to say as to the internal organisation of Louvain University, with reference to the appointment of Professors, and their removal in case of necessity?—Yes. The Bishops are the heads of the University. A Rector appointed by them is their delegate. He is an ecclesiastic. The decree of foundation of the University calls him "Vicar-General of the Bishops." This decree says: "As it is very important that the affairs of the University be permanently and efficaciously directed by one and the same person, we, therefore, place at the head of the University, as our Vicar-General, a Rector, who is to be an ecclesiastic, and whose appointment and dismissal depend on us." A Vice-Rector, appointed also by the Bishops, assists the Rector in the current administration of the University. In fact, the Vice-Rector is especially entrusted with surveillance of the discipline among students. The Rector Magnifique is allowed by the Bishops to provide for all the general interests of the University, but he must give, every year, a complete and faithful account of all he has done, to the Bishops. The Bishops meet every year, and the Rector gives an account in detail of all that he has done in the year. To the Rector belongs the right of proposing the candidates for the Chairs that are vacant; the appointment is made by the Bishops. There are two Academical Councils—an ordinary one, whose name is "Conseil Rectoral," which is composed of the Deans of the five faculties, and presided over by the Rector, and an extraordinary one, composed of all the Professors, and called "Senat Academique." Professors and students have to be Catholic. The teaching must be in accordance with the principles of the Catholic religion. Before entering on his functions, the Rector has to take an oath, at the hands of the Archbishop. This oath is stated in these terms:—"I, Rector-elect of the Catholic University, will be faithful and obedient to the Bishops of Belgium, and, to the best of my ability, I will promote, in accordance with their directions, the honour and prosperity of the said University. So help me God and this Holy Gospel." The Vice-Rector and the Professors make a profession of faith in the presence of the Rector, and take an oath in the following words:—"I, Vice-Rector or Professor of the Catholic University, will observe faithfully the statutes and constitutions of the said University. I will pay the Rector due honour, and will give him my assistance; furthermore, I will promote the renown and prosperity of the University to the best of my power." Finally, the students, before matriculating, have to accept the standing orders of the University, and, as a proof of their acceptance, to put their name on the Register of Matriculation. During the first year of his academical studies every student is obliged to attend a course of religion, one hour a week.

7210. Does that mean religious instruction?—Yes,—course of religion—explanation of religious doctrine. One who would judge from afar this Catholic life of Louvain University might imagine that Catholic students, or even Professors, of Louvain, are lying under a kind of moral constraint. Nevertheless, I daresay (and in so speaking, I am sure not to be contradicted by any one of my colleagues or students), that no constraint of any kind is ever felt by the members of this Catholic body. As the Vice-Rector of the University, Monsignor Cartuyvels, who, for the past thirty years, has fulfilled the delicate duties of the Vice-Rectorship, surrounded by the affection and esteem of all the students, is accustomed to say, "the ruling power at the Catholic University is public opinion." Spontaneously, as a matter of family tradition, and as a result of personal conviction, the most of the students go regularly to their religious duties. Their superiors have confidence in them, and they in their superiors. No sort of systematic inquiry probes the privacy of their lives. The practical force of the law consists in informing the parents of the student who is known to have given up practising his religious duties. The public penalties, which consist in temporary or permanent expulsion from the University, are extremely rare; it is not every year that such a case occurs. Do you want an example of the spontaneity of religious life amongst the students? A week ago the Rector of the University published a proclamation, calling on the Professors and the students to make in common the three public processions demanded by the Pope in order to gain the Jubilee indulgence—no constraint, no order, but, instead, a request, a wish. Well, out of the 1,300 or 1,400 students resident in Louvain, more than 1,000 came forward at the Rector's call, joined themselves to the ranks of the secular and regular clergy in the public procession through the streets of the city, and sung hymns or said prayers with them. Again, we must not imagine that the episcopal authority continually dogs the footsteps of the Professor, in order to subject to a perpetual and rigid censorship his teaching and his life. But we shall return to this point later on. A question which naturally finds a place in this first chapter is how the ecclesiastical authorities look upon the attendance of Catholic youth at non-Catholic Universities. Although Belgium has a Catholic University, with which the whole country deeply sympathises, still a certain number of Catholic young men go to the non-Catholic Universities. Some particular circumstances—for example, the advantage of living at home under paternal guidance; the difficulty, or even the impossibility, for several families to support the expenses of their sons living outside of home—excuse to some extent frequentation of undenominational Universities. But, as a rule, that frequentation is prohibited by ecclesiastical authorities, as it appears from this document, which was addressed to me by the Cardinal Archbishop of Malines, speaking in his name, and in the name of all the Belgian Bishops. I will hand over this paper, which explains the mind of the Bishops on the subject.*

7211. Might I ask one question in reference to that matter? Are we justified in concluding that there is a kind of general prohibition against Catholic students attending the State Universities, but a prohibition which, in certain cases, for special reasons, does not bind?—Just so; the prohibition is general.

7212. The prohibition is general?—But as it is not an evil intrinsically to go to the State Universities, but only a danger, cases may occur in which, for various reasons, the danger is considerably diminished or removed; then, if a person judges that such is the case with himself, attendance at the State Universities ceases to be illicit for him, and prohibition would not be justified.

7213. There is something of the same kind in Ireland. But we will not go into that question now. You may proceed, Monsignor?—The next point is about the freedom of teaching in Louvain.

7214. That is a very important point, and, if you will allow me to say it, we hope you will show that you have not only freedom of teaching, but also freedom of learning for the students—that is, access to books and periodicals, such as will give them a full and complete view of the question at issue?—All right. From the very beginning of the Catholic University, its opponents, who entitle themselves in Belgium the "Liberal Party," maintained that Catholic teaching could not be free. The speeches pronounced by the first Rectors and Secretaries of the University of Brussels developed that fundamental objection. And I have observed that at one of the sittings of the Royal Commission, held in Dublin, the same prejudices were expressed, and especially a direct allusion was made to the case of Professor Ubaghs, who was condemned by the Roman Congregation.† Therefore, I deemed it would be fitting to treat briefly the subject. What is, from a general point of view, the position of a Louvain Professor towards the religious authorities—that is, immediately towards the Bishops of Belgium, and, finally, towards the Holy See?

First, Catholic authorities never prescribe any positive scientific doctrine to be taught in accordance with Catholic dogma; they never interfere directly either with scientific or with philosophical subjects, programmes or methods. Catholic authorities interfere with teaching only when teachers deny Catholic doctrine; their interference is purely negative. If such an interference is said to be a hindrance to liberty, it must be confessed that nobody in the world is free, because nobody in the world has a right to deny the foundations of morality and human civilization. Of course, to the liberty of teaching of a Catholic Pro-

* See page 316.

† See Appendix to First Report, p. 225, q. 3783.

fessor, a restriction is made which a non-Catholic has no account to take of, but the Catholic Professor accepts that restriction freely by the fact that he professes to be a Catholic. In fact, I never knew of anyone among my colleagues who complained of not being as free as he would have wished in his teaching. Practically, the Bishops of Belgium never interfere with scientific or philosophical teaching.

In the whole history of the University, that is, for nearly seventy years, I know but of one fact which could be considered, at first sight, as opposed to the freedom of teaching, that is the case of Ubaghs. Still, this fact does not prove anything against liberty of teaching. Ubaghs had his system of Philosophy which, for a great part, he took from De Bonald. He thought that human reason by itself could not develop; that social intercourse and social language are absolutely necessary to the mental and moral development of a child. Well, that philosophical system has always been free, and yet now, after the decrees of the Roman Congregations remain free. But from that philosophical system Ubaghs derived a theological conclusion. Social intercourse, social language are needed for the use of human reason, he said, because human society, in one word the tradition, is the expression of a Divine revelation made to our first parents. Therefore, he concluded Divine Revelation is absolutely necessary to the mental and moral development of human reason. Well, that conclusion is theologically false, and was condemned. The Roman Congregation, first, the Council of Vatican, afterwards, defended the rights of human reason, and declared that Divine Revelation is not absolutely or physically necessary, but only necessary in a relative and moral sense. In every case, even after the condemnation of his doctrine, Ubaghs taught for twenty years at Louvain, and he resigned spontaneously in 1865. He was then named Professor Emeritus.

7215. With reference to that matter, might I ask you how long did he continue a Professor after his teaching was condemned in Rome? How long did he continue a Professor in Louvain?—The first condemnation was in 1843, the second in 1844, and he remained in Louvain teaching until 1865, and then he tendered his resignation in 1865.

7216. Practically, he was teaching there for twenty years after the condemnation?—Twenty years.

7217. And the Bishops did not interfere with him?—No, they defended him rather against the accusations.

7218. The authorities in Louvain defended him against the accusations?—Yes, the Cardinal of Malines, Monsignor Herckx, did all he could to protect him.

7219. That is an important fact?—The case of Ubaghs is very instructive. It shows, evidently, that the interference of the religious authorities was purely negative, and restricted to the religious aspect of the teaching. Practically, they proceeded by way of counsel, and, finally, it was Ubaghs himself who gave up his Chair. The conclusion of this historical sketch seems to me to be this: that the freedom of teaching may be quite safe in a Catholic University, and, in fact, is quite safe at Louvain. But the objection might be raised: How is the widest knowledge secured for the students? If, for instance, the Professor teaches the Philosophy of St. Thomas, will not the students be unavoidably kept in ignorance of Hegel, Kant, Herbert Spencer? That question I should answer in this way: In my opinion, a Professor, especially in Philosophy, ought to teach a definite system of doctrine. An eclecticism of the opinions of others may be good in a course of History of Philosophy, but the Professor who would give it, instead of his own convictions on the subject, would lead necessarily to scepticism. But, when the Professor has exposed and tried to prove his personal views on a question, then it is useful, nay, even necessary, to compare them with the views of others—scientists or philosophers. At Louvain we try to realise that ideal by practical means, such as these:—First—Every year, beside the course of Philosophy, strictly so called, there are two series of lectures, devoted to an ample exposition of one of the most remarkable systems, either of Modern Philosophy or of Modern Sociology. For instance, the last few years, the lecturer explained successively, Leibnitz, Spinosa, Kant, Hegel, Schopenhauer; others explained the Sociology of Auguste Comte, the Sociology of Karl Marx, the Criminology of Lombroso and Ferri. Secondly—All the principal periodicals of German, English, French, and Italian Philosophy—we have all the reviews of Philosophy which, I think, are published, in German, in English, in French, and in Italian (about 150), are at the disposal of the students.

7220. Are they accessible to students—is that what you mean?—Oh, yes, quite accessible, and perfectly open to them. The most important articles are reviewed by students, and furnish the review of reviews of the *Revue Neo-Scolastique*. Besides the periodicals, the library possesses the original works of all the great scientists and philosophers, and keeps them, also, always at the disposal of the students. We have three libraries. We have a large library for the whole University; we have at the institute where I live, a second library for the students who study specially Philosophy, and, generally, the Professors have a private library at the disposal of all the students. Thirdly—The admission to the licentiate, and *a fortiori* to the doctorate, in Philosophy, requires an original study on a question considered in its bearings to Sciences, to modern thought, or, more commonly, to both, and I dare say that Descartes, Kant, and Spencer are mentioned as often, at the Institute of Philosophy where I live, as Aristotle and Thomas Aquinas. I have a list, for instance, of the last two years, of the works done by the students on special questions having bearings on modern thought, and one has only to look at the sketch to see that Kant, Spinoza, Darwin, Stuart Mill, Karl Marx, were in the scope of those special dissertations of the students.*

7221. Are we to understand that the students have written more or less original dissertations on the Philosophy of those writers whom you have named?—Yes. Of course, they have to express the mind of those philosophers.

7222. And the books of those philosophers, therefore, are accessible to the students?—Of course, always, and they use them. Generally we have them in the original language, and we have translations in French. Usually we have both editions. Then I take another point—scientific and literary activity.

7223. Yes, scientific and literary activity, to show us the work you have been doing?—When the free University of Brussels was inaugurated the Secretary, whose name was Mr. Baron, prophesied solemnly in these terms:—"If it is manifestly proved, through its Organisation Act, that Louvain University is apt, in the highest degree—in a degree, perhaps, unique in the world, to develop in all its purity and perfection the Apostolic and Roman doctrine, it is none the less demonstrated that it is radically unfit to give progressive, complete, and universal teaching." Well, the fact is that nowadays no one of the Belgian Universities is more progressive, complete, and universal than Louvain University. The number of Professors and students has been almost continuedly increasing from the year 1834 till now. In 1834 the University had thirteen Professors and eighty-six students; in 1864 it counted about sixty Professors and 768 students; at present there are 100 Professors and about 2,000 students. The numerical increase will best be seen by casting a glance on the diagram which I have here, showing the movement of the population of the University.†

7224. It describes your growth and development?—Yes; there are two columns; one shows the population of students, and the second shows the examinations which are passed by the students. The numbers of students at Ghent, Liege, and Brussels are, respectively, 796, 1,600, and 1,014.

7225. Those are endowed Universities, and yours is unendowed by the State?—There are two Universities endowed by the State—Ghent and Liege; two are free—Brussels and ours. Numerous institutions have been successively annexed to the five faculties, many courses added to the minimum required by the Government. For instance, I can enumerate the Polytechnic Schools, School of Agriculture, School of Experimental Brewery, School of Political and Social Sciences, first created at Louvain, and copied afterwards in the State Universities on the model of Louvain; School of Commercial and Consular Sciences; Superior Institute of Philosophy, with its different laboratories and schools of research, what the Germans call Seminar—(Louvain possessed a laboratory of Experimental Psychology before one of the kind existed in France); Institute of Biology, of Bacteriology, and many others which are enumerated in the Year Book of the University for 1901, at page 36 and following. I have sent a copy of the Calendar to the Secretary. There is not a second Belgian University where all the institutions existing at Louvain are to be found, but I dare say that every institution of some scientific value which exists at Brussels, Ghent, or Liege, exists also at Louvain. The programmes of the lectures show how many different degrees are obtainable from our University. Here, also, I have a table. They have thirteen different degrees—Bachelorship, Licentiate, and Doctorate—which are obtainable at the University. I will hand that also to the Secretary.‡

7226. You have also, I understand, done something at Louvain in the matter of Technical Schools, like the Brewing School and the Agricultural School?—Yes. I think my colleague, Mr. Nerincx, will expose the

* See page 315. † See page 316. ‡ See page 315.

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details of those institutions. Now, as to the publications of the academical body, it suffices to mention the volume of Bibliography, with a supplement, now with more than 400 pages.* The Secretary has a copy of that. Exactly seventeen reviews are edited, at present, by Professors of Louvain. I have here a list of those reviews of all departments—Science, Literature, History, Social Questions, Philosophy, and so on.† It would not be easy, of course, to reunite all the facts which show the activity displayed by the students of the University in various departments. First of all, I should like to observe that their activity is not merely scientific. Our Catholic youth are not merely satisfied with joining some pious confraternities, but a great number of them devote themselves to the instruction of the people in a school called Adult-school; hobnob with workmen in popular meetings called Patronages, and visit the poor in their homes. There are, in the University, twenty-one conferences of St. Vincent de Paul. Scientific life manifests itself in manifold ways. Outside of the courses properly so called there exist not less than fifteen laboratories for scientific research, seven private societies. similar to the German Seminar where the best students, the very disciples, work with the master himself, learn his methods, and often co-operate in his publications; besides, in numerous clubs, the students, under the direction of one of the Professors, debate, according to their preference, literary, historical, scientific, social, or philosophical questions, especially those of a more actual interest. I know, for instance, at this moment, nine clubs of that kind. Here I have a table of those societies—Seminar for scientific research, and laboratories. It would be too long to read to the Commission; but I will give it to the Secretary.‡

7227. Now, what are the results of this activity?—The most patent result is, in fact, what was in the hopes of the founders of the University; in all the liberal careers, in the cities, and in the country, among laymen and ecclesiastics, the influence of Louvain University is immense. It is usually and publicly said, without any exaggeration, that Louvain University is the most influential institution of Belgium. That is publicly said by everyone—that it is the greatest influence in Belgium. The scientific influence of Louvain cannot be denied. We mentioned above the numerous works published by the academical body, in the book I have referred to. In the different sections of the Royal Academy of Belgium, several Professors of Louvain are to be found. In the section of Medicine the *Secretaire perpetuel* is from Louvain. The foundation of the Scientific Society of Brussels is, in a great measure, the work of Professors of Louvain, especially of the mathematician, Gilbert. The foundation of the Flemish Academy is due principally to the enterprise of Professor Willens of Louvain. From 1875 to 1900, fifty doctors in Philosophy and Letters, in Louvain, were appointed to Chairs in the Colleges of the State; about twenty were appointed to Chairs of the State Universities in Ghent and in Liege. During the same period 189 ecclesiastics were appointed in free Catholic Colleges. The successes of the students have been remarkable. It would be difficult to institute a comparison between the successes of the different Universities merely through the examinations, because there is no common standard to appreciate these successes, as each University has its own examiners. But there is another public standard. There are Scholarships established by the Government in behalf of the students who, after having terminated their professional studies in Belgium, like to go and study abroad. These Scholarships are obtained by competition. According to official reports, from 1892 to 1902, a period of ten years, Brussels obtained seventeen Scholarships; Ghent obtained twenty-one Scholarships; Leige obtained forty-five Scholarships; and Louvain obtained fifty-one. As to the scientific influence of the Professors, a description could hardly be complete. Only some salient facts will be brought forward to show what is due to the initiative of Louvain Professors. I could not expose all that they did, but I can expose what they initiated. In the Faculty of Divinity, Professor Beelen re-introduced into Belgium the study of Semitic languages, which has been thoroughly neglected since the French Revolution. His disciple, Mgr. Lamy, followed on in the same line, and published a considerable work in four large volumes—a Latin translation of the Syriac works of St. Ephren. Professor Van Hoonacker has a good reputation in exegetical researches. In the Faculty of Law, Professor Charles Perin, by his works, *De la Richesse dans les Societes Chretiennes, Les Lois de la Societe Chretienne*, contributed much to show the moral bearing of Economics. Professor Descamps, member of the Belgian Senate, member of the Institute of France, is the General Secretary of the Institute of International Law. Thonissen was the author of the revisal of the *Code de Procedure Penale*. Edmond Poullet has been the initiator of a synthetical history of the *Droit Public des Anciens Pays-Bas*. Van den Leuvel, who is at present Minister of Justice, was the first to introduce into the Faculties of Law in Belgium, a comparative study of Politics. In the Faculty of Philosophy and Letters, Felix Neve introduced into Belgium Vedic studies, and more recently De Harlez promoted much the study of various Oriental languages. The Rector of the present day, Mgr. Hebbelynck, is a distinguished Orientalist in Coptic language. The first Rector, Mgr. De Ram, by his *Synodicum Belgicum*, and the third Rector, Mgr. Nameche, by his History of Belgium, gave a great impulse to the study of our National History. Willems is well known for his works on Roman antiquities. In the Faculties of Medicine and Sciences, Theodor Schwann, who professed at Louvain from 1840 to 1848, is considered, I think, everywhere as a precursor of Lister and Pasteur, and certainly he had a great part in founding the theory of the cellular structure of animals. Van Beneden Pierre, whose researches on the development of worms and the migrations of parasites, contributed to ruin the theory of spontaneous generation; Van Beneden was member of the Royal Academy of London, of St. Petersburg, of the Institute of France, and so on. His son, Edward Van Beneden, who is a talented biologist, studied at Louvain. Carnoy gave a strong impulse to the microscopical researches of General Biology. The first Chair in Belgium of Cellular Biology was established by him at Louvain. Gilbert edited works on Mathematical Physics, which became classical in France. A prize has been given to reward the most important researches accomplished for the last ten years in Belgium, in chemical sciences; Henry, Professor of Chemistry at Louvain, obtained it. Charles de la Vallee Poussin is entrusted by the Government with the task of drawing a general geological map. Van Gehuchten is well known, at present, as a neurologist of value. The Professor of Archæology, Reusens, and the Professor of Architecture, Helleputte,—this is one of the most distinguished orators of the Belgium Parliament—have much contributed to the revival of the Gothic Flemish style in our country. Virendeel is the most reputed engineer for building iron bridges. He won the King's prize (£1,000). Dumont, another engineer, who is teaching at Louvain, discovered recently new coal fields. Perhaps it will not be out of place to add that the Superior Institute of Philosophy (*School of Saint Thomas*), to which I devote my life, took the initiative of combining Scientific and philosophical researches, whereas everywhere in France and in Belgium, Sciences had been, and are still, banished from the Faculties of Philosophy. This latter was connected with Literature and History exclusively. Professor Binet (Annee Psychologique, 1896) congratulates Louvain for having founded, as early as 1892, a laboratory of Experimental Psychology, which in 1896, did not yet exist in France. The Institute of Philosophy publishes three reviews—the one *Revue neo Scolastique* on Mental Philosophy and Metaphysics; two others, *Revue Sociale* and the *Mouvement sociologique*, on social subjects.

The *Institut Superieur de Philosophie* inaugurated also the publication of Belgian mediæval philosophers (*les philosophes Belges*), whose works had not yet seen the light. Professor Thiery, who is at the head of this laboratory, is one of the most clever disciples of Wundt.

7228. The last point is an important point, though rather brief?—Yes; the advantages of the Catholic University to clerical education. It is a well known fact that the ranks of the higher clergy are widely recruited from Louvain. The Belgian Hierarchy counts six Bishops. The University of Louvain gave, during the last half century, ten Bishops to Belgium. Dr. Popiol, Bishop of Plozck, who was exiled in Siberia, and afterwards Archbishop of Varsovia, came from Louvain; the present Bishop of Basle, in Switzerland, is an old student of Louvain. To the United States of America, Louvain gave two Archbishops, Dr. Riordan, Archbishop of San Francisco, and Dr. Seghers, Archbishop of Vancouver, Apostle of Alaska; seven Bishops—Dr. Spalding, Bishop of Peoria; Dr. Maes, Bishop of Covington (Kentucky); Dr. Glorieux, Bishop of Boise (Idaho); Van de Wyver, Bishop of Richmond (Virginia); Meerschaert, Bishop of Dydime and Apostolic Vicar of the Indian Territory; Dr. Blondel, Bishop of Helena (Montana); Dr. Gabriels, Bishop of Odgensburg (New York). At the last Council of Vatican, the Secretary of the Commission of discipline, was Mgr. Fejie, Professor of Canon Law at the University of Louvain. Four ecclesiastics are at present members of

* Université Catholique de Louvain: Bibliographie: Louvain, Charles Peeters. †See page 315. ‡See page 316.

the Royal Academy of Belgium; two of them studied at Louvain, and are now Professors there. Formerly De Ram, David, Laforet, Van Weddingen, whose works are well known, belonged to the same scientific body, and were recruited from Louvain. The most part of the Professors of the Grand Seminaries of Belgium took their degrees at Louvain. In Holland, in Luxembourg, in France, in Germany, in Poland, in the United States, a good number of Professors have come from Louvain; some too, but I am sorry to say, very few, in England and Ireland, studied in Louvain. By the way, let me note that Father Damien, the Apostle of Molokai, was a student in theology at Louvain. From 1875 to 1901, 189 ecclesiastics attended the course of the Faculty of Philosophy and Letters: four of them are University Professors; four are College inspectors; thirteen are Rectors of free Catholic Colleges. A smaller, but still important number of ecclesiastics studied Science or Mathematics at Louvain, and are now teaching the same branches in the Colleges of their respective dioceses. For example, during the past five years, the number of ecclesiastics who frequented the courses of the University were the following:—In Divinity, 52; in Philosophy and Letters, 62; in Philosophy and Sciences at the School of St. Thomas, 120; in Sciences, 52; in Agricultural Sciences, 20; in Political and Social Sciences, 8; in Commercial and Consular Sciences, 11. As a matter of fact, most people are guided by authority rather than by personal conviction. In matters of religion and morals, authority is represented by the clergy. This being so, from whatever point of view we consider it, either Catholic or non-Catholic, the conclusion is the same; it is highly important that the clergy be as learned as possible. From a Catholic point of view, the conclusion admits of no doubt. The two things most appreciated, even by the lower classes, nowadays, are morality and Science. The priest presents himself to the faithful as the represeentative of morality; people like to consider him as such, and on that account they trust in him. Well now, if the priest, being worthy of esteem on account of his morality, were unworthy of it on account of a scientific deficiency; if people, anxious to venerate him for his virtue, were, so to speak, compelled to despise him for his want of knowledge, would not that be an intrinsic contradiction? From a non-Catholic point of view, the same conclusion may be urged still more forcibly. If one supposes that Roman Catholic doctrine be false, what will be the best means to put its falsehood in evidence? Is it not by promoting learning among the clergy? Surely the best means of avoiding fanaticism is by dissipating the shades of ignorance. Nobody, either Catholic, or non-Catholic, could dissent from those beautiful words of Lord Macaulay, with which I bring this, perhaps, too long evidence to a close. "Clerical education is, beyond all dispute, very important. National dignity is concerned with it. Its office is to form the character of those who are to form the character of millions."

7229. With regard to the relation of the Belgian Bishops to the University, I should like, perhaps, their position to be made a little more explicit. Am I right in assuming that all appointments are made by the Belgian Bishops?—They are.

7230. And if it were necessary to remove a Professor, the removal would be made by them also?—The removal would be made by them also—exclusively by them.

7231. And they also, I presume, provide the funds to a large extent?—They provide the funds.

7232. For maintaining the University. Now, they make these appointments I think you said, on the nomination of the Rector and his Council—or on their presentation?—On the presentation of the Rector.

7233. But, beyond these three things: the appointment of Professors, and, in case of need, their removal, and the fact that they provide the funds, the Bishops of Belgium, have absolutely no interference whatsoever with the work of the University?—No. The internal work of the University, for instance, the programmes, the lectures, are arranged without any special interference of the Bishops.

7234. They neither wish to interfere nor, in fact, do they interfere?—They do not interfere.

7235. Am I right, therefore, in saying that, practically, this University of Louvain is a self-governing institution?—It is a self-governing institution.

7236. And I suppose the Rector and the Vice-Rector have very great influence in the government of the University?—They have, the Rector especially, because the Rector is the delegate of the Bishops. The Vice-Rector has less influence, because he is more especially entrusted with the discipline of the University.

7237. This University is a purely Catholic University?—A purely Catholic University.

7238. Nevertheless, you have shown that this purely Catholic University has done the very highest work in all the departments of Science, and has falsified the prediction of that Liberal gentleman at Brussels, whom you have quoted?—Yes. Of course, all the students are Catholic, or at all events, ought to be Catholic, but still, in fact, there are some students who are practically, perhaps, not much Catholic. For instance, there is in Louvain a College of the State, a neutral College, called an Athenæum, and several students coming out of that College attend afterwards the lectures at the University of Louvain. They live with their families at Louvain, which are Liberal, and nobody troubles them; they follow, according to their conscience; they are baptised, and, if they practise or not, I do not know. For instance, the Lord Mayor of Louvain, who is not only a Liberal, but a Radical, is an old student of Louvain; he studied Law. There is no inquiry into the details of the lives of the students.

7239. So that the theoretical regulation of having only Catholics attending the University is not carried out in practice?—As a rule, it is; but the observance of the rule is kept up in such a way that individual freedom is respected. The authorities would not tolerate anti-Catholicism. For instance, if anybody attempted to promote opposition against authority, of course, they would not be allowed there; but when they are quiet, they live without being subjected to any special inquiry.

7240. During your long connection as Professor with Louvain, have you known any single instance, in which the Belgian Bishops, the nominal Governors of the University, ever interfered with the teaching of any of the Professors?—No. I have been there for twenty years, since 1882, and I never knew the Bishops to interfere authoritatively with anyone for his teaching.

7241. That is a very important point. You said that the students had access to the books even of those whom you call heterodox modern philosophers, from your point of view; is not that so?—Yes.

7242. You said that all the reviews, or, practically, all the reviews from England, and Germany, and France, and so forth, were in the University?—Yes, I daresay nearly all.

7243. And accessible to the students?—All Catholic and non-Catholic reviews.

7244. And if they want any of the original works of any of these so-called heterodox authors, they can find them in the library?—They can find them in the library. Each student may ask for them and get them.

7245. Anything they ask for, they will get it, if they want it?—Yes.

7246. Professor BUTCHER.—The only question I should like to ask you is, if very strict care is taken in the appointment of a Professor to ensure his orthodoxy as a Catholic?—Well, when a Professor is presented, or when he asks to be presented, he, of course, knows he ought to be a Catholic, because he has to take the oath that he is a Catholic; but that is all.

7247. That is all that is required?—I never knew of anybody after being presented, having gone openly against Catholic doctrine; I never knew that. Of course, it would be a contradiction.

7248. During your twenty years at Louvain, I understand, there has been no case in which the Bishops have interfered, nor has there been a case in which any condemnation has been passed at Rome on the teaching or writings of any of the Professors?—Except, I think, in the case of Ubaghs.

7249. Except that?—Except that.

7250. That is the only one?—Yes.

7251. Did he, by the way, retract after his condemnation, his opinions, or make any promises of amendment?—Well, I think Ubaghs had always been in good faith. His mind was rather confused. The question was, in itself, very complex. It was partly philosophical and partly theological.

7252. I quite see that?—The point was to distinguish between nature and grace. We know, by Catholic doctrine, that, in fact, Divine Revelation is necessary absolutely for knowing the supernatural order of knowledge. Well, Ubaghs was a self-made man, who had never studied Traditional Philosophy, so he supposed that the necessity claimed for supernatural knowledge was universal, and comprised also natural evolution of the human mind, and so he taught, that for the development of human reason Revelation was absolutely necessary.

7253. I suppose that he was not consciously in any way attacking Catholic doctrine?—Oh, never; he was a priest, and when dying, he was surrounded by the sympathy, and even the friendship, of the Bishops. I know that, before dying, the Cardinal paid him a friendly visit publicly; he died a priest *bona fide* in the faith.

LONDON.

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Right Rev. Monsignor Mercier.

7254. Professor LORRAIN SMITH.—Suppose, in the case of the scientific Professors, their lectures were shall I say, heterodox, how would the discipline be set in working order?—If I understand that, you mean, if a student——

7255. If a Professor is delivering a lecture which taught heretical doctrine, how does the authority of the University exercise itself in relation to the fact?—Suppose a case.

7256. I will put a case before you. You said that Professor Van Beneden, by his investigations into the transformation of worms, helped to refute the doctrine of spontaneous generation. Let us suppose that his experiments had led in exactly the opposite direction, as they led some other eminent scientific men for a certain period?—No doubt he would say, "That is the conclusion of my scientific research"; and nobody would have interfered with him. So, for instance, at the present day, some of the present Professors of Biology are evolutionists, and I know that some Catholics and Bishops rather dislike evolution, while some Professors are favourable to evolution; but they have not got into trouble.

7257. May I conclude that Van Beneden might have taught with perfect freedom the doctrine of spontaneous generation?—Surely he might. In fact, it is so far from being contrary to Catholic doctrine, that St. Thomas considered spontaneous generation not only as a plausible hypothesis, but, as a matter of fact, for some living beings.

7258. Then the illustration hardly serves my purpose. I was trying to find an illustration where the teaching would have been against Catholic doctrine?—Surely, *a priori* conflicts are possible between men of Science and churchmen. Was not England the spectator of a dispute between Bishop Wilberforce and Huxley on the question of evolution? So there have been temporary conflicts between the one or the other Professor and some Catholic theologians. But we may go further, and suppose a case where a Professor would astonish his students by giving a lecture anti-Catholic. Then, I suppose, the Rector would know the fact, and he would call the Professor, and ask him whether it was true that he was positively anti-Catholic. Then the case would be this: He has taken an oath to be a Catholic; if now he were declaring himself to be anti-Catholic, the case would be subjected to the Bishops. But the case has never happened. It might happen; and then the case would be subjected to the Bishops.

7259. For investigation?—Yes; and I suppose the Bishop would call the Professor before him, and ask whether he was anti-Catholic or not, and say, "If you are Catholic you may stay; if you say you are renegade from the faith you will, of course, go."

7260. Dr. STARKIE.—Is there, in such a case, an appeal to Rome from the decision of the Bishops—on the question of faith?—Perhaps there might be; but the case has never occurred.

7261. That is not laid down?—No; the case has never happened. Of course, any Catholic may appeal to Rome from the judgment of a Bishop; but the case has never happened.

7262. Mr. WILFRID WARD.—You handed in a very interesting letter from one of the Belgian Bishops, as to their attitude towards the other University—the University of Brussels—and the State Universities.* Could you let us know the date of the letter—what year, I mean?—It is this year—September, 1901.

7263. It was written, more or less, in connection with our inquiry, in fact?—Just so. When I knew I was coming here, I asked the Cardinal Archbishop of Malines what was his view on the question, and as the Bishops were just meeting, he wrote me, in the name of the Bishops, a letter giving me their view.

7264. There would be no public pronouncement to which you could go on the subject?—No; but there is this one: the Bishop of Bruges, for instance, gave a letter to all the Rectors of the Colleges in his diocese.†

7265. In point of fact, how many candidates do go to the University of Brussels—or is there any difference between the two State Universities, at Ghent and Liege, and the free University of Brussels? Are the ecclesiastical authorities more friendly to the State Universities or to the free University?—They are less opposed to the Universities of the State, because, theoretically, the Universities of the State are secular—not Christian, but not anti-Christian—but the University of Brussels was established against that of Louvain. You ask for the number, the precise number. In Belgium, statistics are never made about religion. Nobody in the public sense is counted as Catholic or Christian. But I presume there are, in Brussels, perhaps, 100 Catholics; in Ghent, also, perhaps 100; in Liege, about 200; that would be about 400, or, perhaps, 500 altogether in Belgium.

7266. Then, in Liege, what is the total number of students?—In Liege, there are 1,600 students.

7267. And only about 200 are Catholics?—Yes, approximately. It ought to be remarked also, that in the Universities of the State some Professors are Catholic. For instance, in Liege, fifteen Professors are Catholic. So that that would make a difference.

7268. You mentioned amongst those successes of the Louvain students, that a good number had been appointed to Chairs in the State Universities. There is no objection to that on the part of the Bishops?—No, not at all. From the Institute of St. Thomas, where I am Rector, four Professors were appointed to Universities of the State. There is no objection at all.

7269. With regard to the clergy who attend the lectures at Louvain, do they mix with the laity—are they on exactly equal terms with the laity there, or do they live apart in any way?—We have, in Louvain, Colleges where ecclesiastics live apart; there are two Colleges, one for ecclesiastics, who are studying Theology, and one for students in Philosophy; but for the courses of lectures they meet together with the laymen. They have their living apart, their pension apart, but, as for the lectures, the scientific societies, the laboratories, and so on, all are common to laymen and ecclesiastics.

7270. Then, they meet, to a certain extent, in societies and social life?—Oh, yes, thoroughly. For instance, where I am, perhaps one-half are laymen and one-half ecclesiastics, and they meet together, they talk together about daily matters in the laboratories for research, for instance; it is one common life.

7271. Is that the seminary life, or is the seminary life separate—are there certain seminary courses in addition to that, or does the life at Louvain fulfil the purposes of the seminary training?—No. There are two seminaries, one for Theology, and one quite distinct for the seminary training. There are two classes of establishments for the training of young ecclesiastics, the diocesan institutions and the University institutions: diocesan for the needs of ordinary students, University for the needs of the most clever and capable students. At Louvain we have two establishments of the latter kind; one, College du Saint Esprit, is for Divinity students, and the other, Seminaire Léon XIII, for students of Philosophy.

7272. So that these ecclesiastical students, who go through the University training, do not, in addition, have to go through a seminary training; I mean that the University training fulfils the purposes of the seminary training for them?—I beg your pardon. There is a distinction made. They may get Philosophy either in the diocesan seminaries or at the Seminaire Léon XIII., annexed to the Institute of St. Thomas at Louvain. But their elementary Theology they have to get in the seminaries. When they have finished their ordinary elementary Theology, they come back to Louvain to the various faculties, to make profounder and deeper studies of the subject.

7273. Then you gave us a very interesting account of the case of Professor Ubaghs part of which was new to me. I should like to ask one question about that. You explained that he taught a philosophic system which was greatly based on the traditionalism of Vicomte de Bonald. Then you further explained that it was for certain theological additions to that system that he was condemned. Would it be open now for a Professor to teach the system of de Bonald, apart from any theological additions?—Yes; that was the point, I think. The precise point was this: Catholic doctrine is that human reason, when it is developed, is capable of demonstrating—for instance, that God exists, that the soul is immortal, and so on; but the question of how is the human mind developed, how can the human mind have the use of reason? That *is* a pure philosophical question; and that question is yet free.

7274. The general trend of de Bonald's Philosophy is very different from the scholastic system; but would you give liberty to a Professor now, if he thought well, to follow those lines?—He might be free to do so. But at the present day I do not think anybody would teach de Bonald's system, because it is philosophically untenable; but theoretically, a Professor would be free to do so.

7275. In point of fact, you do not bind a Professor to take the scholastic view?—No.

7276. Is there a special Chair of the History of Philosophy?—There are two Chairs of History of Philosophy. One is occupied by Bossu, who gives Modern Philosophy and Ancient Philosophy; and the second one is occupied by Professor De Wulf, who gives History of Mediæval Philosophy, and just now he has made a great collection of Belgian philosophers which were, hitherto, not published.

The Witness withdrew.

The Commission adjourned until the following morning.

* See p. 316. † See page 316.

TWENTIETH DAY.

SATURDAY, DECEMBER 21, 1901.

LONDON.
Dec. 21, 1901.

AT 10.30 O'CLOCK, A.M.

At St. Stephen's House, Westminster, London.

Present:—The Right Hon. Lord ROBERTSON, M.A., LL.D., P.C. (Chairman); The Right Hon. Viscount RIDLEY, M.A., LL.D., D.C.L., P.C.; The Most Rev. JOHN HEALY, D.D., Lord Bishop of Clonfert; The Right Hon. Mr. Justice MADDEN, M.A., LL.D., P.C.; Professor S. H. BUTCHER, LITT.D., LL.D.; Professor J. A. EWING, M.A., LL.D., F.R.S.; Professor JOHN RHŶS, M.A., D.LITT.; Professor J. LORRAIN SMITH, M.A., M.D.; WILLIAM J. M. STARKIE, Esq., LITT.D.; WILFRID WARD, Esq., B.A.; Rev. Professor R. H. F. DICKEY, M.A., D.D.;

and Mr. J. D. DALY, M.A., Secretary.

Rev. JOHN PENTLAND MAHAFFY, D.D., Senior Fellow of Trinity College, Dublin, examined.

7277. CHAIRMAN.—Dr. Mahaffy, I need hardly say that we know your titles and designations, and I need not ask you upon them. You have considerable knowledge of the existing provision for higher education in Ireland outside Trinity College?—Yes, my lord. Before I go on, I should like to say that I appear here, not because I was anxious to give evidence, but because I was invited by several members of the Commission. I also wish to say that I appear only for myself, and not representing any public body. I only give my own opinions.

7278. If you have arranged the observations which you propose to offer to us, perhaps you will kindly adopt your own order?—Very well, my lord. I have taken pains to read this book of evidence, and it was very great labour. The first thing I wish to say is about finality. There has been much discussion as to whether an arrangement could be final or not. Of course I know quite well that finality is only a relative term; but there are some arrangements which would give to the Universities and Colleges a chance of agreeing, and some which would not; and if an arrangement could be made which would give them all an opportunity to agree it would be much better than an arrangement which excluded the possibility of such agreement. Next, I come, now, to the question of the want that many witnesses have expressed—the great want for a Roman Catholic College or University. That want has been put upon two grounds: first, on the grounds of religious belief, and, secondly, on the social ground. Now, with regard to the ground of religion, I am bound to express to your lordship the Protestant criticism of that, as well as the criticism of many intelligent Roman Catholic laymen, who have spoken to me on the subject. Many of them think, and Protestant opinion in Ireland asserts, that it is a demand, not of the Roman Catholic people of Ireland, but of the Bishops, and that the Roman Catholic laity are by no means so unanimous in the matter as would appear from the evidence in your Blue Book. The case has been quoted of Hugh, Earl of Tyrone, who, when practically Lord of Ireland, put upon his Articles—Article 14 in the State papers of Queen Elizabeth, "that a University be established in Ireland, paid from the Queen's Rents, which shall teach all the sciences after the fashion of the Roman Catholic Church."* That has been quoted as showing the want felt by the Irish people in those days for a Roman Catholic University; but anybody who reads history knows that Tyrone spoke as the mouthpiece, not of the Irish Roman Catholic people, but of the Roman Catholic Ecclesiastics; and that that, which was the earliest demand made for a Roman Catholic University, was not the demand of the people, but the demand of the ecclesiastics, whose desire was, and is, to dominate the whole situation. The objection, of course, which the intelligent laity who have talked to me about it make, is the objection which comes out very clearly in Sir Rowland Blennerhassett's evidence; namely, that if a Roman Catholic University is established, the Bishops must be the absolute judges and masters of the whole business. It has been said by Bishop O'Dwyer that the Hierarchy do not propose to interfere in secular knowledge. But, my lord, when they are the judges of what is secular knowledge, and what is not secular, it is manifest that they must dominate the whole situation. They have interfered, as you know, in the teaching of Astronomy; and one of the last things they interfered with was "Palgrave's Golden Treasury," which they thought was an unfit book for the education of the young. Protestants say that it is power—ecclesiastical power—that is at the back of the whole thing, and not religion; and when we are told of the great danger of attending the Queen's Colleges or Trinity College by Roman Catholics, my own forty years' experience of Trinity College is that, while I have known a good many men who have become Roman Catholics after going to Trinity College, I only know of one who became a Protestant, and he became a Protestant because he had a quarrel with his Bishop about articles which he wrote on mixed education, and the Bishop stopped his practice at the Bar. With regard to the stories which have been told you about young men in Trinity College or Queen's College, that the moment they heard some sceptical suggestion, their faith tumbled like a house of cards, that is a reflection, not upon the Colleges, but upon the education which they got, either from their parents or from the clergy at home, before they come into the Colleges. I apprehend it that any young man who was properly ground and educated in his own faith would not be afraid of or injured by hearing something said adverse to it. When we were undergraduates at Trinity College we used to escape from our own College to go and hear John Henry Newman preach in the Roman Catholic University that then was. We delighted to hear him preach, and preach Catholic doctrine, and we were not the least bit afraid that he would convert us, because we had been taught our own creed properly. That is what I have to say about the religious demand.

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Now, with regard to the social demand, that there is this immense mass of people dying for University Education. There has been a good deal of evidence on that point by various other witnesses to show that the Intermediate system has already tapped the population that want, or ought to have, such education, so that we cannot expect another great mass behind them who have either the means, or the time, or the brains, to be educated in a new University. On that point I can give you the references. Of course, you know the Blue Book better than I do, but I can give you references to the evidence of several witnesses who showed that there is not a great quantity of people to be reached by any new system.

I should like to call your attention to the mischief done by the University of Athens, which, some twenty-five or thirty years ago, when I first went to Greece, established free education, and gave degrees without any fees at all to all clever people who liked to attend it. The result was that all sorts of adventurous poor came to the University, from all parts of the Greek world, and lived as porters, and as water-carriers, and as sweepers of streets; they could afford only one text-book between three or four of them, and one candle, and they used to

* The full reference is "Catalogue of State Papers (Ireland)," Vol. 1599–1600, p. 280.

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read by turns during the night; one would read for two hours and then go to sleep, and then another would read for two hours. It was apparently a most delightful and pathetic thing to see the anxiety on the part of these persons for learning. But what was the result? The ordinary business of life was neglected, the fields even of Attica lay untilled, and those persons who had congregated together in Athens, and obtained education in the University, devoted themselves to politics, became political agitators, wrote articles in the newspapers and magazines, and ultimately became a most dangerous and turbulent element in Greek society. Your lordship may have seen recently the account of the riots led by University Students in Athens, apropos of the publication of a version of the New Testament in Modern Greek; and the remarkable feature of the thing is that they are not boys, but middle-aged men who have neglected and given up their proper pursuits in life, gone to the University, and, not being able to live honestly after getting their degrees, have become dangerous malcontents. I think the similarities between the Modern Greek character and the Irish are so strong—I have noted two or three of them in my books—that I think you might fairly be afraid of some similar results in Ireland. It seems to me, therefore, that the necessity of Ireland is not for a greater quantity, but for a better quality of education.

But supposing there is a want—let us admit that there is a want—which has to be satisfied. Of course it can only be satisfied, in the first place, by the justice of safeguarding, say, the degrees that women are now taking very laboriously and very diligently; and any system that would exclude them from degrees would not have finality—But I venture to say, speaking for myself, that there is some probability, at least, of Trinity College not standing in the way of a solution in that direction. The next thing we have to do is to abolish the many causes of want of confidence in the Royal University. On that point, former witnesses have spoken so fully, that I need not repeat their evidence. As to what is claimed by the Roman Catholic party as justice, there are two distinct claims which I beg to separate very clearly. One is the claim for equality with other creeds, and the other is a claim for restitution, which was put, I think, by one of the Commissioners at page 201 of this Blue Book. I do not know exactly what this restitution means. I will point out what happened in Quebec eight or ten years ago. The Crown handed over certain Crown property in Quebec to the Parliament of Quebec when federation was adopted. There was a claim made by the Jesuits on this Crown property at Quebec. This was a few years ago when I was there. The claim was that the French King had disestablished the Jesuits and taken their property and made it French Crown property. Many years after the French Government had done that, the property became the property of the British Crown, and remained the property of the British Crown until the other day, when they ceded that Crown property to the Parliament of Quebec. The claim of the Jesuits was that they demanded *restitution* of this property, which was originally the property of the Jesuits, and had been taken from them, not by the British Crown, but by the French Government. I can state a parallel case in Ireland. The Monastery of All Hallows was granted by Henry VIII to the City of Dublin for its loyalty to him, and after some long time the City of Dubiln granted part of it to Trinity College, Dublin. On exactly the same argument a claim might hereafter be made for restitution of that property to the Monastery of All Hallows. That is a claim which I wish to put before your lordship in its nakedness, and it is not a claim for the equality of education.

Now I come to the question of there being established one University with several Colleges; that is to say a College for Roman Catholics, a College for Belfast, and whatever College there may be in Dublin. I am precluded from talking about Trinity College. I notice that one of your most excellent witnesses, Dr. Whitla, says that this is the worst solution of all. If there was an arrangement made which rendered it possible for the present University of Dublin, with Trinity College, to come into it, I think that would be a better solution than any other solution which would make it perfectly impossible for them to agree. Some of the witnesses have said unpleasant things about it being merely a matter of pounds, shillings, and pence. I would point out to your lordship that Mr. Gladstone in the schedule of his University Bill, made ample provision for the pecuniary security of every single one of the Fellows of Trinity College. In fact, there would have been much greater pecuniary security than under any other Bill, but they rejected the Bill with scorn, declaring that it was not a matter of pounds, shillings, and pence, but of principle. Now, my lord, I go on to the model that I think might be the best model for a new arrangement. The model I propose for a new University is exactly the model which now exists before your eyes in Dublin, I mean of Trinity College and of the University of Dublin. None of the witnesses, I venture to think, have put that before you very plainly. The University of Dublin is a distinct corporate body from Trinity College, Dublin; it has a distinct seat, but it has no property; it is not a governing, but a registering, body. It registers the degrees which the Fellows of Trinity College think fit to confer, with a right of veto—not merely a power of veto by the majority of the Senate, but a power of veto by individual members of the Senate. There are three members of the Senate, viz., the Vice-Chancellor, the Provost, and the Senior Master, non-Regent, each of whom individually has power to veto the conferring of degrees. Such cases have happened. Therefore, though the Senate is not a governing Senate, does not appoint the examinations, does not fix the books, does not in any way manage Trinity College, it has a power of veto by which the whole College could be brought to a dead-lock to-morrow, and that Senate, which is a registering body and not a governing body, consists simply of the Doctors and Masters of the University—not of persons put on because they are Protestants, or because they are Roman Catholics, or because they are judges, or because they are lawyers, but simply of the Doctors and Masters of the University. Take, now, another College or several Colleges, under another such University; those Colleges to be really autonomous, ought to have all their examinations, Professorships, and teaching, under their own control; and what they would do would be to bring students up on what is called the University examination, held by the Colleges, within the Colleges, and brought up on the authority of the Colleges, to the registering body, who would then decree that those degrees should be given. Of course, if there were a great scandal, those degrees might be stopped. But there are many advantages in all the teaching and all the professional work in each College being absolutely autonomous and independent. First, there would be no joint examinations, in which the pupils of one College might have an advantage over the pupils of another, except, it might be, in the case of a few inter-University prizes, where you could get a Court of Examiners from outside altogether. Also you must insist upon an equality of fees and terms in the various Colleges; that is to say, one College ought not to be able to undersell another either by shorter time or less money in the qualification for a degree. The matter of under-selling is one of very great danger in Ireland. Under the present system, the Royal University of Ireland is under-selling the University of Dublin, and it is now found that private establishments are under-selling Belfast College.

Your lordship may say, how will you secure that the degree examination in the various Colleges shall be of a fairly equal standard in such a University. For that you must appoint a small body of curators, not necessarily Irishmen, but men of eminence, who ought to be paid officers, whose special business it would be to go round to the Colleges, and if they desired, to appoint external examiners, and to report to the Visitors that the standards were fairly equal. I anticipate the objection that the courses would be different in the various Colleges, and that therefore there would be no unity in the form of the degree. That I answer by saying that in Trinity College there are several different courses—a student may go in one of ten different courses; but our Senate in Dublin takes no cognisance of these things. The only thing it does take cognisance of is that the examinations are honest examinations and it takes the word of the College that the men deserve to get degrees. Now, as I say, if you adopt this system, in the first place, you would prevent the danger of underselling, of cheapening degrees, by which the cheapest College would get the most pupils. You would also avoid the evils of indirect endowment, so much complained of, for if you establish a Roman Catholic College, it would be directly and honestly endowed, and, as Sir Rowland Blennerhassett told your lordship, it would be governed absolutely by the ecclesiastics. If there were twenty laymen on the governing body, and only one Bishop, the twenty laymen would be as sheep in his hands. Then all the objections as to dishonesty and unfairness in the examinations would go, because each College would examine its own students, and they would be responsible to the Curators for their examinations, and there would be no complaint of Protestant or Roman Catholic candidates being unfairly treated. Then, too, you would be able to remove what I have always preached against in print, the great objection to scattered Colleges under one University, that so long as those scattered Colleges have one common examination, the outlying Colleges are at a disadvantage. That has been proved in the case of the Royal University; it has been proved in the case of Victoria University (Owens College, Man-

chester, Leeds); and it is coming on now in the Welsh University, which has Colleges in various places, because men from one College have to examine students from another, and there are complaints of injustice. That would be all obviated if the examinations of each College were carried on in that College for the pupils of that College. The most important thing of all, perhaps, in such an arrangement, would be that by appointing as your Senate, only the Doctors and Masters of the Colleges—you might, perhaps, have to begin with the teaching staff—you would get rid of the crying evil in Ireland of appointing men to secure a balance of creeds and nominating people who know nothing about education, because they belong to a certain creed. This poison of creeds is permeating the country in a terrible way. Roman Catholics say, on the one hand, that owing to their having been debarred from the means of obtaining higher education, they have not got men qualified to fill positions in which such education is requisite, and that they want to train abler men than they have. But on the other hand, I undertake to say that if there were an endowed place, in which higher education was required, vacant to-morrow, the Catholics would say they had a hundred men fitted to fill it. I never knew a place to remain derelict because men were not competent to fill it.

I now come to the question of giving degrees by examinations only, which has been objected to very much by several witnesses. Well, I feel bound to say that the allusions to Trinity College in that respect have been grossly unfair, and many of them quite false. In the first place, as to the number of our students who pass by examination only. It was stated in evidence before, I think, the Commission of 1852, that there were 60 per cent. or something of that kind. We have taken pains to go into the figures, and we find that only about 12 per cent. of our students do not attend lectures during some part of their course; and I have pointed out to the gentlemen who made up these figures that they have omitted the case of students, which is common enough, living in the Colleges, attending commons, attending chapel, but preferring to pass by examination instead of by lectures. There are men who live in the College for four years, who never attend lectures, and who pass by examination, and they are residents in the strictest sense. And of those 12 per cent. I wish to point out that three-fourths are Welshmen and Englishmen, not Irishmen; many of them are ushers of schools, who spend their time in teaching in Wales and the West of England; they have not the time or the means to attend lectures, but come over and pass the examinations in the College. That class, however, is rapidly diminishing, on account of the University of Liverpool and the University of Wales, so that they are provided for at home, and that class of students in Trinity College is a vanishing class. In the next place, I want to point out, in criticism of the statement of Sir Christopher Nixon, who says that three only of the examinations are University examinations, and that the other six examinations are only College examinations; that distinction is very important at Oxford, but not at Trinity College, because the standard of all our examinations is exactly the same; they are all equivalent to University examinations, and it is quite common for a man who has missed his Little-go to supplement in his next term, mostly on the papers that were set in one of the other examinations. The nine examinations are all strict, and are a totally different thing from three University examinations and some small things in the College. Then there is the question of giving degrees to women. At least, in the case of women, from the difficulties of their attending lectures, it might be desirable not to close that means of taking a degree.

There is, of course, the other solution of having, not several Colleges under one University of the particular type that I have described, but a number of separate Universities. With regard to having separate Universities, there is this objection, that under-selling could not be stopped. You would have to leave the separate Universities free, and the danger in Ireland is that the cheaper University might attract a great number of people on account of its facilities. They might undersell one another, not only in the matter of fees, but in regard to standard also, though it is curious that I should argue in the interest of the Roman Catholic Church, it seems to me that if a Roman Catholic University admitted, as they say they will do, any number of Protestant students—that if what they call "the atmosphere" of the institution, be determined by the students, not by the teachers—if a large number of Protestant students went into the Catholic University, how could the Catholic Bishops prevent the "atmosphere" becoming dangerous to that delicate creed which tumbles like a house of cards at the least criticism? It appears to me that either they would have to gag the Protestant students, or they would have to allow the Catholic students to submit to the terrible dangers of this "atmosphere." But if it was a wholly Catholic College with the same fees and the same terms as the sister Colleges, I think they would be safe from that extreme danger. These are all the observations I have to make.

7279. Most Rev. Dr. HEALY.—Dr. Mahaffy, I will not touch on any of those questions in your interesting evidence which seem to have any relation to what you call the "poison of creeds": I think that was the expression you used?—No; the poison I meant to refer to was the poison of appointing by balancing of creeds. I said the poisonous principle of appointing people by the balance of creeds—first a Roman Catholic, then a Protestant, and so on.

7280. At any rate, I do not want to touch on those questions. But you said that it is not a greater quantity, but a better quality, of education that we need in Ireland?—Yes.

7281. Yes, and I quite agree with you. Do you not think that the best way to secure a better quality of education is to give an opportunity to the half-educated boys of the Intermediate Schools, especially to the better minds amongst them, of getting a good University Education?—They have that opportunity now.

7282. Where?—They have forty-three free places in Trinity College.

7283. Suppose it has been proved and admitted as a fact that most of those boys, for conscientious reasons, will not, under any circumstances, go to Trinity College, would you say that they have that opportunity?—They have, at present, I believe, a quantity of prizes at the Royal University.

7284. Are you prepared to admit that the Royal University, as a University, gives this high and better quality of education?—No, it is not good enough, certainly.

7285. Do you think it gives the better quality of education that we need?—I cannot offer an opinion about that.

7286. My point is this, Dr. Mahaffy. You say, and I agree with you, that we need a better quality of education. You are a member of the Intermediate Board. You know you have a very large number of boys from all the schools in Ireland, amounting to between 8,000 and 9,000 altogether, attending the Intermediate examinations. Many of them go to the Senior Grade, but the great majority of them disappear, and the great majority of those who disappear are Catholics. The Catholics disappear, even the brightest and the best amongst them, because they have no opportunity of getting a University Education without doing some violence to their conscientious convictions. Now, if that be the state of things, and you want a higher quality of education, is not the most natural thing to do to provide some kind of University Education for those young men that they can accept?—If your lordship pleases, I do not object to that, but I do not admit that all this large number disappear because they have no University to go to. I think that this is a question which is very important. It seems to me that if you did educate them in a University to their liking you would not have places to give them, and you would encourage what your lordship might not like—a great emigration of clever young men from Ireland.

7287. I should be very glad to see talented young men, especially if they had the advantage of a University Education, going through the whole British Empire as young men do from Scotland, for their own good, and for the good of the Empire. I should be very glad to see that happening in Ireland; I think that that is one of the advantages to be derived from the establishment of this University or University College in Ireland?—I do not object to that.

7288. What I want to point out is this, because I think that we are practically agreed, but it appears to me that you expect that these boys who want a better quality of education would seek it in Trinity College, and not seek it elsewhere. I cannot accept that view, because I respect the conscientious convictions of these boys, and, if they say: "We would rather do without University Education than get it in either Trinity College or the Queen's Colleges," and, if we know that that is the fact, surely it is only right and proper to provide means for those boys, especially the more

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talented amongst them, to get education of a better quality?—I do not object; only the very clever ones, I think they could go to Oxford or Cambridge, if they liked.

7289. Then, there is another point, and that is all I want to trouble you about. You have referred to a question which was asked, and which appears on page 201 of the Blue Book.* This was the question asked of a witness—"whether he would regard a general settlement of this question from a pecuniary point of view as father a restitution for the destruction of Catholic institutions, or what I will call the absorption of Catholic funds for higher education in the past, I mean in the distant past"?—Quite so; that is, such as Trinity College, for example.

7290. I think you implied some complaint or dissatisfaction with that question?—I thought it a dangerous question for a man living in Trinity College—a very dangerous question.

7291. Will you allow me to develop that point? I do not blame you certainly for being so frank; but I want to develop the point. I think it a reasonable question to put. I suppose that you will admit that in the beginning of the sixteenth century—the far distant past—the chief provision for any kind of education in Ireland was in the monastic schools?—Yes.

7292. I suppose you will readily admit also that the monastic schools in the East of Ireland were practically all destroyed in the time of Henry VIII., and in the West and North of Ireland in the time of Elizabeth and the beginning of the reign of James I.?—There were very few in the North of Ireland.

7293. But there were some. There was an excellent school in Donegal?—I suppose you mean when the Four Masters were there.

7294. Then, we will not go into that. If the schools in Ireland, which existed north, south, east, and west, at that time, were destroyed by a process of confiscation of this kind, and if the funds, as I think you must admit they were, were absorbed by the Government, and, to a very considerable extent, the lands which supported those monastic schools were given to Trinity College, and are held by Trinity College to this day—the point I would put now is this: If that be so, is it an unreasonable thing for the Catholic majority to say, "Seeing that you have got so much of what really belonged to us, or, to a great extent, to us, in the past, is it not reasonable that you should rather unite with us in giving us some compensation for all that by way of an endowment now?—I will not disagree with you.

7295. Professor RHYS.—We had some evidence yesterday about the Welsh University from two competent officials of that young institution, and they said nothing about any difficuly as to its examinations. They complained rather of the difficulty of attending meetings, in different places, between the three Colleges. I do not know exactly what you were referring to as a difficulty with regard to the examinations?—I referred to a letter which I have in my possession, but which, being a private letter, I could not produce. It is from a young Professor. I had written an article on the subject of the Colleges, and he wrote to me to say he was in a dreadful state. He had been appointed to one of the Colleges, where he was told he might teach in his own way, and that he would get his turn in examining in his own views. He said that in the first place, he had not been, as he had expected to be, appointed an Examiner, and the result was that his class would not listen to his own views, but asked him to teach them what would pay for the examination, and he was hampered in his teaching, because he was a teacher in a College from which the students had to go up to a common examination.

7296. Professor BUTCHER.—We were told that each Professor is *ex officio* an Examiner in his particular subject?—This particular young man was not.

7279. Is he a Professor?—Yes, but you can easily see how it is possible to arise; you cannot have them all examining at every examination.

7298. Professor RHYS.—The Professor at the head of each department is invariably, as far as I know, an Examiner?—I only take the evidence that I have in my hand.

7299. I will not go further into that: I am not sure that I quite comprehend it. I wish now to learn what you would suggest with regard to the lady students who aspire to a University degree or a University Education. They are a very important element?—I agree with you quite in that. If I had my own way, I should license the Alexandra College in Dublin as a College for ladies. I should license them to keep terms which might count in Trinity College, Dublin, and give them a degree there. Our lecturers could go to the Alexandra College to lecture, if necessary. But I think they might be provided for in Alexandra College. That is my private opinion.

7300. Mr. Justice MADDEN.—That, I may say, is the opinion of others besides yourself?—I am glad to hear it.

7301. Dr. STARKIE.—In case Trinity College did license Alexandra College as, I suppose, an associated College—sometimes there is a difference made between an associated and an affiliated College—so that the lectures given there should count, you might extend that very easily to other Colleges. In Belfast, Victoria College might be licensed by Belfast College; St. Mary's College in Dublin might be licensed by the Catholic College; and, in that case, it would not be necessary to keep up examinations for external students?—It would not, but I think it might be necessary to reduce the fees.

7302. There would not be the danger of competition there?—No. I beg to state that the Catholic or Protestant, or other Colleges for ladies would require endowment to meet the new difficulty of having lectures from University lecturers in their Colleges. I know Alexandra College would, and I am sure other Colleges would. I think Alexandra College has a very strong case for endowment; it started on borrowed money, and has now a large income, and a fine staff of teachers. An institution which has done that surely deserves endowment, if any institution does. St. Mary's College may be just as good.

7303. Consequently, I infer that you would be in favour, if there is a re-organisation or a re-construction of the University system in Ireland, of external students being no longer recognised?—I am quite ready for that.

7304. In regard to Trinity College, I heard from you what I knew before, that less than 12 per cent. of the students do not reside during some part of their course, and I believe it has been suggested—I think by yourself—in Trinity College that you should provide for some of those students by means of a summer course?—That is so—a summer course for men who are ushers in schools, so that they could attend in their holidays. I believe that the number of students we should lose by stopping the system of giving degrees by examinations only would not be five per cent.

7305. And those five per cent. might be provided for by the examining system, which is continued under the London University?—Yes.

7306. Am I right in inferring that in your opinion one examining system in the British Empire is quite sufficient?—Yes; perhaps it is more than enough.

7307. Then, to come to your proposal that many Colleges might be affiliated under Dublin University, or, if Dublin University is excluded, under a University?—An University in Dublin.

7308. Each College being absolutely autonomous and independent, having its own Lecturers and Professors?—Yes.

7309. The Professors of Trinity College differ from the Fellows, as being University officers; the Fellows are College officers?—Yes; that is a distinction—a nominal distinction—but still, a distinction.

7310. But still, in this new University, the Professors would not have an opportunity of lecturing to the students as, say, they have in Oxford and Cambridge, on account of the fact that the Colleges are distributed in various parts of the country?—I would make all the Professors College Professors. The distinction, which is really no distinction in Trinity College, between a Professor who is a University officer, and a Fellow who is a College officer—that distinction I would abolish.

7311. As you know, in the Royal University, they absolutely reverse it; they call the officers there Fellows of the University and Professors of the Colleges?—When they talk of Fellows of the University it is obvious that they do not know the English language. A Fellow of a College can never be a Fellow of the University. You might as well talk of the Horse Marines. A Fellow of a University is a monstrous term.

7312. There is only one other point I wish to refer to. I think you said that you were aware, or that you ha

*See Appendix to First Report, p. 201., q. 3266.

a very strong conviction, that the Catholic laymen were not as unanimously in favour of the claim for a Catholic University as has been represented?—I think so.

7313. I suppose you know that there was a petition signed by a very great number of the Catholic noblemen and gentry, and presented in 1870, in favour of a Catholic University?—Yes.

7314. And that this was repeated *totidem verbis* in 1897?—I know that, too; and I have seen an enormous number of people sign requisitions for Home Rule, who, if they thought it was really coming, would be terrified.

7315. CHAIRMAN.—Dr. Mahaffy, I should like to ask you one or two questions. First of all, on the general question. Do you think that the present provision for higher education in Ireland, outside Trinity College, is adequate to the needs of the Irish people?—In quantity, certainly; but in quality, I think not.

7316. But you think that in quantity it is?—Yes.

7317. I want merely to put to you for your consideration certain views which have been placed before us. It is said that, as a matter of fact, and whatever may be said as to the causes which have led to it, the Queen's Colleges are not made use of in the West by the Roman Catholic population. It is said that that results in a considerable number of people who, naturally, would go to College, not going at all, owing to the Roman Catholic objection. Now, is it, in your judgment, a fact that there are a certain proportion of the population available for University Education who do not get it for that reason?—So far as Galway is concerned—I know the country all about Galway very well; as a sportsman I have gone over it very frequently—I do not think there is any population in Galway that has any fair claim to University Education. I think, if you established an Agricultural College in Galway, then you might tap a large amount of the population.

7318. What do you say about Cork?—I do not know Cork so well; but there must, of course, be a great many people in Cork who ought to get a University Education. But I do not know Cork, and I do know Galway.

7319. I should like to understand a little better your own suggestion. Am I right in thinking that your ideal would be that one University should cover and include Trinity College, a Roman Catholic College, if so be, and the Queen's Colleges?—I think, if any change is made, that is the best. I do not advocate any change; but if any is made that is the best.

7320. Now there is one part of your scheme which struck me in passing. I do not profess, of course, to have had time fully to consider it. You say that in order to keep the training in the Colleges up to the requisite standard you would have a body called "curators"?—Yes.

7321. That would be an essential part of your scheme, would it?—Yes.

7322. That would be a guarantee for the standard of education being kept up in all the Colleges?—Yes.

7323. Now, my criticism, occurring merely on the spur of the moment, is this: You say that they might be persons from outside Ireland?—Yes.

7324. And you say they must be paid?—Yes.

7325. Would not that at once cause a dead set to be made on them from any quarters that were dissatisfied with the keeping up of the standard of education?—I do not see it.

7326. I will illustrate it. They are to be paid, and, I suppose, by moneys to be voted by Parliament. Does not that suggest anything to you as to the occasion and the kind of criticism that would be bestowed upon their laudable efforts in the interests of education?—I suppose that the money would be voted for generally; I suppose it would be an item in the general endowment of education.

7327. You have not been in the House of Commons?—Oh, no; but supposing, for example, as an hypothesis, that Trinity College was in the scheme. Men of that kind would be able to screw up the education given in the other Colleges to the level of Trinity College.

7328. My point, however—which I merely throw out for your consideration—is this: it seems to me, on the spur of the moment, that that would at once make, as a focus of unpopularity, this external and, probably, English body of men, and that all sorts of agitation might be got up on the occasion of their salaries being voted in Parliament. It might be said, for instance, that they were really playing the game of Trinity College, and trying to put down the kind of education which was suitable for the wants of Ireland?—They might do it, as has been suggested, by appointing external Examiners to be present at each of the Colleges; they might do it that way; and the external Examiners would, of course, see the papers, and report.

7329. In your opinion, Dr. Mahaffy, would your scheme be workable, supposing you keep Trinity College and the University of Dublin as they are?—Yes, I think it would.

7330. Would it not come to be very much a remodelling of the Royal University?—Yes; re-modelling in a very complete and thorough sense.

7331. You would endeavour to eliminate the "one and one" arrangement?—Yes. I think you would have to reform the whole Senate—if you call that remodelling.

7332. Have you considered the way in which you would replace the Senate?—Yes. Of course, in time they would become, as they are in the University of Dublin, the Doctors and Masters. But you would have to start with something, and I would start with the teaching staff of the various Colleges.

7333. In order to carry out that idea, I think you are assuming that there is to be established a Roman Catholic College pure and simple?—Oh, yes, certainly.

7334. In fact, in all your alternative suggestions, that is an essential element?—Not essential; not necessarily. If there is a want for it, and you consider there is one, there is no objection to it. I am not so sure about it; but if the want be there it can be satisfied in that way. But I press upon your lordship that it will have to be "pure and simple": the Bishops will have to be complete lords of it.

7335. And you say that merely because it would represent the fact and the reality of the situation?—Yes.

7336. Professor RHYS.—I am not quite sure that I understand what you suggest should be done with the Royal University. Would it continue to exist at all?—I should prefer to wind it up and get rid of it absolutely.

7337. In case there was a Roman Catholic College established in the way you suggest, its vocation would be gone?—Yes. You would have to establish a new body. It would be much better to establish a new University with these Colleges than to try and tinker with that very leaky body, the Royal University.

7338. Professor LORRAIN SMITH.—Would that University be the University of Dublin, or a new University?—Unless the present University of Dublin could be got to agree to it—there is now a University of Dublin, and you cannot take the name a second time; but if the University of Dublin did not choose to agree to it there would have to be a second University.

The Witness withdrew.

M. ALFRED NERINCX, Ph.B., LL.D., D.Polit.Sc., Professor of Constitutional Law in the Catholic University of Louvain, and Secretary of the "Institut de Droit International," examined.

7339. CHAIRMAN.—You are Professor of Constitutional Law in the University of Louvain?—Yes.

7340. How long have you been there?—This is my third year.

7341. What is the Institution of which you are Secretary?—It is the Institute of International Law, founded in 1873, which meets in various cities of the Continent, and sometimes in England or Scotland, according to the resolution taken by the institute every two years. The seat at present is in Brussels.

7342. You are aware of the evidence that has been given by Monseigneur Mercier?—Yes.

7343. And I think you are prepared to mention to us various matters that Monseigneur Mercier did not dwell upon?—Yes.

7344. Then would you kindly proceed in your own order?—The first point with which I wish to deal is the legal status of the Catholic University of Louvain. It has no corporate existence, for the reason that its corporate existence was taken away from it when the University was abolished, in 1797, by the French administration, and it was never restored legally. In the year 1834, the Bishops of Belgium wished to reconstitute the University, and they re-established it under the shadow of the metropolitan See of Malines. But the next year—in fact, a few months after—the municipal authorities of Louvain went to the Bishops and asked them to bring the University back to Louvain, and undertook to give them the free use of a certain number of buildings—of the old University—which had not yet been converted into barracks, hospitals, and municipal schools, as was the case

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with a large number of those old Colleges. The Bishops agreed, and the University was reinstated at Louvain. The very next year, another University—a free Liberal University—was established by the Liberals at Brussels. There are, besides, two other Universities in Belgium, at Ghent and Liege. These two are practically State Departments, divisions of the Higher Education State Department. The University of Louvain has no corporate existence, for this reason, that an association under our law has no corporate existence unless that existence be granted to it either by a special statute, or by the Government, acting under a general statute. In the year 1841, the Bishops had agreed that a Bill should be brought forward in Parliament by some private members for the purpose of giving Louvain University a corporate existence—incorporation—but the Liberal opposition of that time started a movement in the country against the proposal. Public opinion, not so much in the country as in Brussels, which has always been a Liberal centre, fought against the proposal, and nearly started, I should say, riots in the streets of Brussels. The Bishops were afraid that some very serious mischief might happen, and under the advice of the papal Nuncio, Monseigneur Fornari, they requested the members to withdraw the Bill, which was done accordingly. Since that time the Liberals of Brussels have found for their own University the very serious inconvenience that we felt from the absence of corporate existence, and they themselves, for the last five or six years, have urged upon public opinion, in their Rectorial addresses every year, the necessity of giving to the University of Brussels a corporate existence, and very likely the Bishops and Catholic opinion will avail themselves of that movement to support a proposal which may be brought forward in the near future by the Government to incorporate both Universities separately. The present legal position of the University of Louvain is this: It occupies some buildings free of charge, it has the enjoyment of its old library, but that library is, to the extent of the old books extant before 1835, the property of the city of Louvain; the University has the use of it only. Any new books, the appliances of the schoolrooms, the apparatus of our laboraories and museum are bought by our Professors or by the order of the Rector, and as regards the property in them, there are two schools of judicial opinion. One school of opinion, actuated, I believe, by a feeling rather hostile to freedom of teaching, is inclined to maintain that the University, having no corporate existence, anything that is acquired for the University can belong to nobody. In consequence, suppose I go and buy a book, and the book is stolen from me, these lawyers will hold that I cannot claim back the book because I did not own it. It is the same way with other appliances. Suppose something is stolen from the museum of the University; they would hold that the Rector cannot sue the thief, and he cannot claim the object back, because he does not own it legally. But there is another school of legal opinion upon the subject, and we maintain that the Bishops, among themselves, being the administrators, and founders of the University, constitute a partnership. Of course, it is not a commercial partnership; it has not the character of a commercial corporation, neither is it under the Civil Code a *société civile*—but is it something very much like a *société civile*, and it comes under the same rule; that is, that in their collective body they have a civil capacity; they can own property; and the Rector and the Professors, when they buy books or appliances for the University, or when they erect buildings or buy land for the University, do so as representatives of this association of Bishops. That is the opinion we maintain. Further, the University is empowered by the general statutes of higher education to confer degrees. These degrees are conferred by the University of Louvain or the University of Brussels, or by the State Universities. They are absolutely legal. There is no State control whatever over the conferring of these degrees or the examinations. The only intervention from the Government side is that when the degree has been conferred it must be submitted to the examination of a Commission which enters the degree upon a register if the degree has been legally conferred—that is, if it has been conferred on a student of the University, if lectures have been given on the subjects prescribed by the statute, for that degree. It is upon questions of form only that this Commission examines the degrees. When the degrees have been examined by the Commission and entered upon its register, they have what I might call their professional worth. For instance, suppose a man takes the degree of Doctor of Laws in the University, he must have been in the University for five years, he must have taken first the degree of Candidate of Philosophy and Letters, which requires two years of study, and, in his three years of Law, he must have taken the degrees of Candidate of Law and Doctor of Laws. Then he goes up to the Commission; the Commission enters the degree in the register. He may then take the oath of a barrister, and practise in the courts. He could not do that before he had had the degree entered by the Commission in their book. The University receives no grant whatever, as a University, from the Government. It has for one of its departments a small grant—nearly £400—a year. That department is the School of Commercial and Consular Science, for which it receives a grant of nearly £400 a year from the Department of Labour. I wish to draw the attention of the Commission to a misprint in the Summary of my evidence; it is not the University of Labour; it is the Department of Labour which grants this sum of nearly £400 a year. Another grant was given a few years ago, for a short time, to the University by the Catholic majority of the Provincial Council of Brabant, where the University is situated. A grant had been given for a great many years by the Liberal majority of that Council to the Liberal University of Brussels. I think it is five or six years ago the majority of the Council was changed. They did not take the grant away from the University of Brussels, but they enlarged the amount of the grant, and divided it equally between the University of Louvain and the University of Brussels. Four years later, the Liberals came back in a majority, and the first thing they did was to withdraw the grant from the University of Louvain, and to give it back, enlarged, to the University of Brussels, who hold it. That University also enjoys a substantial grant of, I believe, £4,000 a year from the City of Brussels.

7345. Most Rev. Dr. HEALY.—How much from the Government?—Which University do you mean?

7346. Brussels?—Brussels has nothing at all from the Government, but it has a grant from the Provincial Council of Brabant, which, I think, I may compare with a County Council. The curriculum of studies is regulated by a statute; I have here a copy of the statute of 1890, regulating the curriculum of studies for every degree. Of course, we must give that minimum of lectures to our students for the degrees, but, except for that, we are absolutely free, and we have availed ourselves to a very large extent of that freedom in Louvain to institute whatever courses of lectures we think should be given. For instance, in the Faculty of Law, the University of Louvain has a course which does not exist in the other Universities. It is a course of lectures of two hours a week on the relations between Church and State, and it is taken in the first year of the study of Law. Then, we have also special courses which we Professors found between ourselves. For instance, the School of Political and Social Science, with a course of two years; the School of Commercial and Consular Science, which takes three years; then special Schools of Agriculture, lasting four years; Schools of Mining, Electricity, Brewing, and various other departments, of which a list will be found in the short account of the history of Louvain which has been submitted to the Commission.* The way in which these Schools are founded is a peculiar process in the University of Louvain. The Schools are generally founded on the proposal of some of the Professors of the Faculties, and practically founded by the Professors, of course, with the approval of the Rector, who is, in this case, the representative of the Bishops. But, in almost every case, the Professors have among themselves tried to find the means of supporting their schools, and they have taken upon themselves for a nominal supplement of salary, the charge of giving lectures in those schools. It is only by way of exception sometimes that the burden of supporting some of these schools has finally fallen upon the Bishops. When, for instance, the School of Agriculture was founded in 1876, it was founded at the request of a Scientific Society in Brussels, by the Professors of the University. A scheme had been started for collecting yearly subscriptions for the School, but the subscriptions fell short of what had been expected, after a few years, and the Bishops had to take charge of the School, and supply the funds for it. But, otherwise, for instance, for the School of Commercial and Consular Science, we have, in addition to a grant from the Government, a grant from the Bishops, and then we appeal to several of our friends, business people, in Antwerp, Brussels, and some other parts of the country, and they practically support the School.

* L'Universite de Louvain: Coup d' œil sur son Histoire et ses Institutions 1425–1900: Bruxelles—Charles Bulens, 1900.

The success of the University has been very remarkable. It has always had the largest number of students of any University in Belgium. I do not think that was only because it was a Catholic University, but I am sure that the scientific value of its teaching has been a serious element in its success amongst the population of Belgium. The students of Louvain to-day are 2,000 in number; I think the latest official statistics will show that there are a few more than 2,000. The grand total of students in the Belgium Universities in 1900 was about 5,200, of which nearly 2,000 belonged to the University of Louvain; that is, more than one-third of the student population of Belgium came to the University of Louvain, notwithstanding the fact that there are three other Universities, and that nobody is obliged to frequent an University, because degrees may be obtained from examining Commissions appointed by the Government outside the Universities for non-University students. There are a few—I think between 200 and 300—every year who avail themselves of that opportunity of making their studies privately. The results of the University of Louvain have been that a Grand Prize was awarded to it last year at the Exhibition of Paris; it enjoyed that distinction with the State University of Liege, who won it, I believe, for its electrical and mining exhibits. The University of Louvain had it chiefly for the exhibit of its Medical department and Biological Institute.

7347. CHAIRMAN.—What was the exhibit?—It consisted in photographs of the class-rooms, museums, and works published by the Professors. We have in Belgium a scheme of Government Scholarships. Government Scholarships are given to the number of fourteen every year, and are awarded after an open competition between all graduates of two years' standing—that is, within the two years that follow the obtaining of their degree of Doctor of one of the faculties of the Universities. These competitions are carried on every year, and the University of Louvain has been peculiarly successful, as Monseigneur Mercier showed in the general statistics yesterday. But I wish to point out the success of the University in the department of Law and Political Science especially. For the last six years the University has sent to these competitions students of its School of Political Science, of which a short account has been submitted to the Commission, and you might find in that account that the essays published by the students have obtained nine out of the twelve Government Scholarships that have been awarded during the last six years.* I would like to submit to the Commission, also, an abstract of the register of the former students of Louvain, showing the various walks of life into which the students of the University have entered. I can give statistics relating only to the former students of the Faculty of Law. Of course, I had not much time to inquire into the subject, and I am not familiar with the other faculties. The Faculty of Law, from the year 1863, has had a certain number of graduates, amongst whom we find fifty members of the House of Representatives, and four Presidents of the same House. The Parliament to-day, out of eighty-seven Catholic members, has fifty-four students of the University of Louvain. In the Senate we find, to-day, out of fifty-eight Catholic members thirty-two students of Louvain. The number given in my summary was twenty-seven, but that is only relating to the Association, because we have some members of the University of Louvain who are not members of the Association of former students, as they are absolutely free to enter the Association or not. There have been three Presidents of the Senate belonging to the same Association, and the present President of the Senate and the present President of the House of Representatives are both former students of the University of Louvain. There have been, out of that Association of the Faculty of Law, fourteen Ministers, of whom five were Professors of the University; and three were Prime Ministers. Out of the present Cabinet of eight members five are former students of Louvain. The Councils of the Bar established in various parts of the country have at present ten former students of Louvain as Presidents. I count amongst the high officials of the King's Court and the State Departments, and Governors of provinces, forty-six former students of Louvain. Then, amongst Presidents and Vice-Presidents and leaders of provincial Councils, and members of the provincial executive authorities, I find forty-two students of the University of Louvain. Among the judicial body of the country, judges, from the President of County Courts to members of the Court of Appeal, Presidents and members of the higher Courts of the country, State Attorneys in the higher Courts, or, as we call them, *Procureur du Roi*, I find thirty-eight former students of Louvain; and in the ranks of the ordinary judges and State Attorneys in local Courts, I find 130 former students of Louvain. In 1885, when the first jubilee of the re-establishment of the University of Louvain was celebrated, our Faculty of Law had given, in fifty years, forty-eight judges of the highest rank, and 175 ordinary judges. Our School of Commercial and Consular Science, founded not quite five years ago, has already given to the Consular Service ten Vice-Consuls residing abroad. There is, besides, the Association of Former Students of the Engineering department of the University, which has been mainly instrumental in providing the funds for projecting new coal fields in Belgium, which has been highly successful. An important point, I believe, in the inquiry of this Commission is, how far the Professors of the University enjoy freedom of teaching. I may say that in the Faculty of Law, to which I belong, and with which, of course, I am best acquainted, we enjoy the fullest freedom of teaching, not only from the conscientious, but even from the political point of view. We have several members of the Faculty who are Members of Parliament, and it has happened quite often that on some subjects they have voted against the Government of which some of their colleagues of the University were members and Ministers. We have never been in any way hampered by any intervention, either from the Bishops or anybody else. The only limitation to which we are subject is in our capacity of Catholics: the respect due by Catholics to the fundamental dogmas of Catholic doctrine. I would like to point out in that respect a slight difference, but which has its importance, between the text of the oath which the Rector takes on his appointment and the oath which the Professors take. The Rector takes an oath to govern the University according to the mind of the Bishops—to be faithful and obedient to the Bishops of Belgium, and to promote, in accordance with their directions, the honour and prosperity of the University. We, Professors, take an oath to observe the statutes and constitution of the University, to pay the Rector due honour, and to promote the renown and prosperity of the University to the best of our power—as the Latin text says—"*Rectori Magnifico debitum honorem impendam atque auxilium præbebo; pro viribus quoque splendorem et prosperitatem Academiæ curabo.*" But there is nothing in the oath which binds us to the will, or to the mind, or to the opinion of the Bishop, or any other authority, on any subject of law or thought, outside the fundamental dogmas of Catholic doctrine. Although it is Catholic, and governed by the Rector, the University is not a clerical institution; the majority of its Professors—a large majority—are laymen. In the Faculty of Theology, of course, they are all clerical. In the Faculty of Law we have ten laymen, as against one cleric; in the Faculty of Medicine there are thirteen laymen as against one cleric; in the Faculty of Science, thirty-one laymen as against seven clerics; in the Faculty of Philosophy, ten laymen as against ten clerics. I have drawn up, with regard to the success of the University, some statistics extracted from the Statistical Report published by the Government. I think the Commission will require me simply to hand them in to the Secretary, and I beg to hand them in accordingly.†

7348. Most Rev. Dr. HEALY.—There are one or two questions I should like to ask you, and they are chiefly with regard to the sources from which the funds necessary for the maintenance of the University are derived, because to us in Ireland, at least, it seems a wonderful thing how the Belgian Catholic people are able to maintain so vast an institution. You said, I think, that many of the Professors of the staff have merely nominal salaries—very small salaries?—I said supplements, not salaries. The Professors are paid in this way: Every one of them gets a fixed salary from the University, but besides we have the whole of the students' fees, and that is the largest part of our income—the fees paid by the students.

7349. Am I right in thinking, or is it a fact, that what we call the "landlords" in Ireland and England—the great majority of these in Belgium are Catholics—the landed proprietors?—Yes.

7350. And I suppose these people send their sons to be educated at Louvain?—Oh, yes, a large number.

7351. And are they generous, might I ask, in their gifts to maintain the University?—We presume that they must be. Of course we do not know what they do, but the fact is that the University itself receives nothing from the fees; it receives no grant; and, since

* Université Catholique de Louvain: École des Sciences Politiques et Sociales: Louvain—Joseph Van Linthout, Imprimeur de l'Université. † See page 317.

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the Professors get their salaries, and new buildings are erected and maintained, and the whole University kept going, we presume that funds must come abundantly from the Catholic laity. In fact, the Bishops frequently appeal privately to their friends, and twice a year a collection is made by the parish priests. But I think the largest amount is derived from what we call the Diocesan Funds for the purposes of the University. We do not know how they are collected, but they are.

7352. I was given to understand also that many individuals in Belgium, as I believe in this country also—in England—wealthy individuals—give very large donations from time to time for new undertakings in the University?—It has happened. Of course, if the University had its corporate existence given back to it, it would be a great inducement to wealthy people to bequeath large sums to the University, but, as I say, the hardship of not having a corporate existence has really, to a large extent, killed the endowment spirit in our people. They do not like to bequeath sums to an individual; they would like to give them to an institution, but they do not care to give them to an individual, because the case might probably arise that, if they did so, and that individual were to die, the money would go to the heirs of that man, and not to the institution at all. But certainly they often give large sums; for instance, the Electrical Institute, the building of which and the primary equipment of which cost £10,000, was entirely provided out of donations last year.

7353. You have given us a list of a great number of high officials in various departments of the State who are past students in the Faculty of Law: Do these gentlemen also give large donations to the maintenance of the University?—Possibly; I could not answer that.

7354. The Bishops do not publish their accounts, I suppose?—No, for this reason: I think they are wise in not doing it, because we must always take into account that there is a very large proportion of public opinion in our country, just as well as in France, which has still the old prejudice against clerical mortmain, and if they knew the University had resources, it would probably arouse their *convoitise*, as I might say.

7355. Mr. Justice MADDEN.—I want to ask you one question in order to understand a passage in your evidence. You spoke of the Catholic members of the Senate and other bodies. Are the non-Catholic members members of any Protestant denomination?—No.

7356. I thought not; you merely mean those whom you would hardly recognise as "Catholics"?—It is a condition of things peculiar, I believe, not only to Belgium, but to a great many Continental countries.

Mr. Justice MADDEN.—So I understand; but I wanted to make that quite clear.

7357. Professor EWING.—I should like a few words more about the technical side of the University. You mentioned just now, in answer to the Bishop, that you have an Electrical-technical Institute?—Yes.

7358. Besides this, have you any further appliances for teaching other branches of Engineering?—Certainly; we have what we call a department of special Schools of Engineering,—Mining, Bridge Building, Civil Constructions, as we would call them, and the Electrical department; every branch of the Engineering Science is taught there in the Faculty of Science. That is what accounts for the large number of Professors in the Faculty of Science, which is by far the largest in the University—nearly forty Professors.

7359. I understood that that was so, but I wished to bring the matter more plainly out?—It is so.

7360. And all these branches have appliances, I suppose, for practical teaching?—Oh, yes. You will find in the short account of the history of the University, and in the Calendar, the list of laboratories, museums, and apparatus, which are at the disposal of the Professors.

7361. And do you find that there is a large possibility before your students, after they have taken their course, of getting practical employment?—Certainly; a large number of them go abroad. Of course, many find employment in the country, but a great many go abroad. For instance, nearly the whole tramway system of Italy has been built by Belgian engineers, and the whole tramway system of Spain has been built, and railways also have been built by engineers, a large number of whom have come from the University of Louvain. The Professor of—I do not remember exactly what was his branch, but he was a Professor of Science of the University of Louvain, went out to found the University of Santiago twenty-two years ago.

7362. And the expenses of these various laboratories, how are they met? You have told us that all the fees paid by the students go to supplement the Professors' salaries: in that case what is left for the expenses of the laboratories?—There is a small contribution made by every student for the use of the laboratory. It varies with the laboratory; in some the expenses will be more heavy than in others; but these contributions do not cover, I believe, the costs of the laboratories. The supplement is drawn from the exchequer of the University—that is, from the Bishops.

7363. Professor LORRAIN SMITH.—I should like to hear a little about your experience in the Faculty of Commerce and Consular Science. First of all, how long has it existed?—This is the fifth year; it was founded in 1897.

7364. In what subjects have you Professors?—We have Professors of Languages, of the English, German, and Spanish Languages; Russian and Chinese Languages; Political Economy; Mechanism of Credit (that is, the Banking and Exchange business); Civil Law; Maritime and Commercial Law; Industrial Law; Comparative Commercial Law; Book-keeping; business in general; and the practice of a business department inside the school (there is large room devoted to it); Statistics and Colonial Science; International Public Law; Comparative Public Law; Industrial and Commercial Geography; Commercial Chemistry; the Elements of Constitutional and Administrative Law; Commercial Politics and Tariff Law; Consular Law, the elements of Private International Law; Diplomatic History of Europe since 1830; the elements of Moral Philosophy, first year; and that is all.

7365. How long does the curriculum last?—Regularly it lasts three years.

7366. What strikes me in the list you have read is that you have rather developed the legal side of this Faculty; is it connected with Faculty of Law?—It is connected, but it is a personal union only—that is, the same Professors give lectures. The lectures are appropriated to that grade of sudents who have made no study of Law. It is only Elementary Law. For instance. I give, in the Faculty of Law, a course of constitutional Law two hours a week, but for these students I give the Elements of Constitutional and Administrative Law, one hour a week only for a half-year.

7367. The teaching in the Law subjects is all Elementary?—Yes, except Commercial Law.

7368. Quite so. Coming to the Mechanism of Trade, —that is the practice of Commerce, is it not?—Yes.

7369. How do you solve there the problem of connecting the academic teaching with the practical work of Commerce?—We have men from outside the University for the purpose of this school—a few practical men. For instance, the Commercial part of this school is under the care of, I think I may call him, a business man. He is not exactly in business, but he has been the head of a large department in a big bank, and he is the Professor of the Theory and Practice of Business. The school is an annexe of the Faculty of Law, it is not in the Faculty, nor is it in the University. The Professors of this school are not University Professors except those who come from the Faculty to lecture there on some subjects; the others are not included in the University.

7370. Do you give a degree or diploma, or both?—Yes; the first year leads to the degree and diploma of a candidate of Commercial Science; the second year to a licentiate of Commercial Science; the third year to a licentiate of a superior degree of Commercial Science; and if they wish to take the International subjects to which I have alluded, they may have the title of Consular Licentiate as well. Then, if they care to write an essay, publish it and discuss it, they may receive the degree of Doctor, in the same way as we have it for the School of Political Science, which is not an official department—I mean it is not recognised by the statute regulating the studies of the higher rank in Belgium, but it is what I may call post-graduate work; the student must have graduated in the Law School before he can come to Political Science, and then he may get a Licentiate after two years' study, and a Doctorate after the publication of an essay on a thesis approved of and published by the school.

7371. Finally, to what extent have the merchants in Belgium responded to the work of this school?—The most effective support they have given to the School was, first of all, to provide funds for starting it and to keep it going. Next, I could not tell you exactly how many have availed themselves of the opportunity of the schools, but I know that last year three of our young men went out on a mission—a commercial mis-

sion—to Japan, and one to Australia. A few others are already placed in banking houses or large business firms in Belgium. Of course, this is only the fourth or fifth year, and we have as yet no statistics.

7372. I know; and it is perhaps hardly fair to ask the question?—It is quite fair; but we have only eighty students to-day; that is the number we have at present.

7373. The point of my question was, how the merchants had responded to the work of the school?—Well, they provide funds every year.

7374. Professor RHŶS.—I was going to ask you with reference to the fourteen Government Scholarships: the candidates for these may attend any one of the four Universities?—Yes, it is quite an open competition; they are not Scholarships for going to the Universities, but Travelling Scholarships. A student who takes a Scholarship there must travel for eight months of the two following years.

7375. And what does the travelling imply?—Well, I got that Scholarship, for instance, and I spent six months in the German Universities of Berlin, Heidelburg, and Strasburg. The next year I went to the United States—to New York, Princeton, Philadelphia, Washington, and Boston; also to Chicago. Then I came back, and went to Paris, to the School of Political Science, under the guidance of Professor Larnaude, of Paris; and then I went to Italy, to Rome, and to the School of Political Science in Florence, and the School of Law in Bologna.

7376. You consider this a useful feature of your system, I suppose?—Undoubtedly.

7377. With regard to the bulk of your students, you mentioned a good many that had taken high positions in the State, and so on. Do many of them return to commercial life, or to their ordinary lives?—It depends very much from which faculty they come. Now, for instance, I only alluded to former students of the Faculty of Law; these, of course, would either go back to legal practice, or to some of those positions of which I have spoken; but a certain number of them are wealthy young men who need not work. It is considered fashionable to have gone through a course of legal studies, even if you do not intend to pursue an active professional career in after life.

7378. They would return to their families—to their properties?—Yes.

7379. And is that the case, do you know, with any large number from the other faculties: do they return to their ordinary life, commercial or otherwise?—More especially those who, for instance, come from the Faculty of Science—the engineers. Very often, of course, an engineer will send his sons to the Faculty of Science, or a landed proprietor will send his sons to the Agricultural School. The Agricultural School has done a great deal for instructing the landowners—the landlords—to enable them to give good counsel to their tenants.

7380. Where would the bulk of those go, for instance, who took up Agriculture—would they go back to the land?—Back to the land; yes.

7381. That is very satisfactory. With regard to the department of Electricity, and some of the other Departments of Science that are making the most rapid progress nowadays, have you any leading men in point of research?—Yes; but I am not very familiar with these subjects.

7382. But still you hear of them?—Oh, yes. The department of Electricity has only just been founded—last year. There always used to be, of course, some lectures upon Electricity, but it has been now founded as an Electro-Mechanic Institute, or School, of itself. The chief engineer of that school is Professor Ponthiére, and he is assisted by a young Professor of the name of Professor Gillon, who was entrusted by the Belgian Government with a mission this year. He went to the United States for three months, during the Long Vacation, to inquire into the state of Technical Education, with special reference to Electricity, in the United States. Of course, the list of eminent men which Professor Mercier has drawn up, I think, will give the names of some of these men.

7383. You recognise research as one of the objects of the scientific part of the University?—Oh, undoubtedly. I remember the Rectorial Address of last year, and of this year, especially, alluded to it, to thank some of the Professors who had done brilliant work in that department, and to encourage the others.

7384. Dr. STARKIE.—Who conducts the examinations for the State Scholarships?—It is a Commission appointed by the Government, consisting of one Professor taken from every University of Belgium.

7385. That is what you called a "mixed jury"?—Yes; it consists of four members, presided over by a judge from the Supreme Court.

7386. What is the present opinion in Belgium as to these "mixed juries"? I have seen many passages in older books on education in which they were very severely criticised, and it was said that on account of the fact that you had representatives from rival institutions, the papers set were entirely wanting in individuality, and that the effect of such papers upon the teaching was to destroy originality?—That is certainly not the case with the Government Scholarships, because the competition is absolutely open and free. The student may choose whatever subjects he pleases. For instance, I took, for the subject of my Essay in that competition, "The Legal Organisation of Elementary Education in England"; and any other competitor may take just what subject he pleases.

7387. There is no fixed programme?—No fixed programme at all.

7388. That system of examination probably is of recent date, because I have read that at one time, at any rate, in Belgium there used to be a fixed syllabus?—It is done in other kinds of Scholarships; for instance, Scholarships to enable the students to pay the University fees in some Universities. Every year the Government asks the four Universities of Belgium to give a list of questions, and these questions are published, and the questions are taken up on every subject.

7389. "Published"; what do you mean by that?—That is, they are given as subjects of competition.

7390. But does that mean that the questions are published beforehand, and that the candidates write essays or tissues on these?—For certain competitions, yes; for some of the competitions. Now, for instance, every year the official gazette—what we call the *Moniteur Officiel*—will publish that list of questions, and the candidate may write his thesis upon any one of them, and send it in.

7391. That is a very different thing from the style of examination papers to which we are accustomed in this country?—Yes.

7392. Is there any difference of opinion in Belgium on the subject of these "mixed juries"?—Not that I know of. For the non-University students, what we call the "jury," the Examining Commission, is composed of a Professor from each of the Universities, and presided over by a judge either of the Court of Appeal or the Supreme Court.

7393. There are never allegations, are there, of representatives of any particular University favouring their own students?—Well, they could not; their own students may go to the University, you see—the students of the University may be examined in the University, and it is mostly non-University students that come to these examinations.

7394. Oh, is that so?—Yes. Of course, a student from one University may come there; I do not know whether there is any special favour shown him; I could not tell you, but I think not. I am sure the examinations are conducted in a very impartial way.

7395. The point of my question was that I wanted to know whether there was a general opinion in Belgium that that system worked out in an impartial way?—Oh, yes.

7396. Professor DICKEY.—I think it is probably within your knowledge that, besides the attention which is paid to subjects such as Electrical Engineering in your University, the same subjects are also very adequately represented in other Universities of Belgium?—Oh, yes; for instance, in the University of Liege, Senator Montefiore founded a few years ago an Electrical Institute, which was from the first very successful, but the reason for which we thought it necessary to found an Electrical Institute in the University of Louvain was that a great many of these young men, Catholics, used to go to the University of Liege for the purposes of electrical instruction, and it was not that their faith ran any great danger from the electrical instruction given at the University of Liege, but from the whole environment surrounding the young men. They are not under the same moral supervision there; they are lost in a large town, and that may be a great danger for young men; whereas Louvain is a small place, where they are under the constant paternal care of the University authorities, and, if they show signs of going astray, they are called back and warned of the peril.

7397. Do they reside in halls of residence?—There are two halls of residence, in which a certain number of the students may reside, but by far the larger number of students reside in quarters in the town.

7398. Lodging-houses, I suppose?—Lodging-houses, yes.

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M. Alfred Nerincx, PH.B., LL.D.

7399. And are these lodging-houses under special licence from the University?—Not under special licence, but some of them are under supervision.

7400. But they are not officially approved?—Not officially approved.

7401. And how do the fees payable by the students at Louvain compare with those payable in other Belgian Universities?—The fees are the same, only the amount of the fees is much larger at Louvain than anywhere else.

7402. The amount is larger?—The whole amount is larger, but the figure which every student has to pay is the same at Louvain as at any other University of Belgium.

7403. I do not quite understand, then, how the amount is larger?—Because there are more students.

7404. Quite so; but I meant the fees payable by the individual student?—Oh, no; they are the same. In some departments I think they may be smaller; anyhow, there is not much difference. For instance, in the Faculty of Law, the student pays £12 a year as fees, and a registration fee of £1.

7405. So that in comparing the various Universities in Belgium, there is nothing to be said about one underselling another?—Oh, no. I do not think there is any serious underselling.

7406. Mr. Justice MADDEN.—Have you in Belgium any institutions for the purpose of teaching Practical Science, like the great Polytechnic Schools in Germany, which stand outside the University system?—Well, with us they are in the University system.

7407. That is what I wanted to bring out. In that respect your system of preparation for such professions as Engineering—Mechanical Engineering, Electrical Engineering, Civil Engineering, and so on—differs from that of Germany?—Oh, yes.

7408. In Germany the great institutions, of which I have spoken, supply that want outside the University system; in Belgium, as we have heard from your evidence, it is supplied from within?—From within.

7409. And is your experience in favour of your system?—Well, on the whole, I think it is. The reason for which these Schools—for instance, the School of Brewery, the School of Commerce, some of these Applied Science Schools which some people are inclined to consider as non-academical institutions—the reason for which they are in the University in Belgium is that they were not previously founded outside; private initiative did not work to found those Schools outside. Then, of course, the Bishops, who were advised by the Professors to found an institution, founded it in the University, and it became a tradition, and was endorsed by the Bill of Higher Education—the statute recognised as legal degrees these Applied Science degrees.

7410. Is there any special course provided by the University for such students—do they specialise from the moment of entry?—Oh, no.

7411. Do they proceed with an Arts course—a course in Literature, and a course in Pure Science?—Pure Science in their own department, yes; but they do not take an Arts course, or rather, I should say, they take one, but it is not the Arts course of the University, it is something special for them. It is what they call two years of preparatory study; they have the elements of Philosophy, some of the elements of Literature, elements of History, and the like.

7412. Professor DICKEY.—*Apropos* of the questions Mr. Justice Madden has been asking you, I notice that in the programme of the School of Brewing, which was put before us, there is a very large amount of what might fairly be called Pure Science introduced as part of the educational course, so that a student following this programme might well be said to have had, within limitations, a liberal education?—Oh, yes, that is what we aim at. So is it in the School of Commercial Science; we aim at giving these young men not only a strict professional education, but at the same time a liberal education.

CHAIRMAN.—Thank you very much for the interesting evidence you have given us.

The Witness withdrew.

Right Rev. Monsignor MERCIER, Professor in the Faculty of Philosophy and Literature, and President of the "Institut Supérieur de Philosophie," in the University of Louvain, further examined.

Right Rev. Monsignor Mercier.

7413. Mr. WILFRID WARD.—Only one or two questions. In the course of your evidence you mentioned L'Ecole de Philosophie de St. Thomas Aquinas, and I understood it was founded for the purpose of studying the Philosophy, including the Social and Physical Science, of St. Thomas Aquinas. I shall be glad to hear in what way St. Thomas's doctrine is treated—how far it is treated as final, and how far not?—Well, at the University, according to the law, there is a Faculty of Philosophy and of Letters. There they teach Philosophy, Logic, Psychology, Metaphysics, and they teach History, Greek, Latin, and Letters in general, but there is no course of Science at all, so one may become Doctor of Philosophy and Letters without having any elementary information about Physics, Chemistry, Biology, and so on; and, therefore, the Pope was very desirous to have a general institution where Scholastic Philosophy could be cultivated, together with all Modern Sciences, and compared with Modern Thought. In 1889, the Pope thought the moment was come to realise his idea, and then he founded the Chairs of Philosophy, properly so called, or a course of Mental and Moral Philosophy, Metaphysics, Logic, and so on, and, in addition, he established a course of Science—Physics and Chemistry for the first year, with Mathematics; for the second year, all the Biological Sciences, General Biology, and Zoology, Physiology, especially Nervous Physiology, and Experimental Psychology; for the third year, Economical and Political Science, but all those Sciences are cultivated from a general point of view; there is no technical teaching of Sciences, but a general teaching of Science. All that is technical of course, is excluded; Sciences are taught only in the pure scientific way.

7414. As I understand, Physiology and Biology would not be taught in accordance with St. Thomas Aquinas' views?—The Professors of the University come and teach their Sciences just as they are taught anywhere else—they teach them in connection with Philosophy; the Professors of the Institute of Philosophy, who are seven in number, teach all the connections between Modern Thought, Modern Sciences, and Philosophy, and the idea of the Pope was that thus the students should be taught to know what is to be rejected from the old doctrine of St. Thomas, and what, in the present day, could still be kept up. And therefore, the Professors who are Professors of the Institute of Philosophy have gained two Doctorates, one in the Philosophy of St. Thomas Aquinas, and another in Science. For instance, the Professor of Cosmology has gained a Doctorate in Chemistry in the University of Leipzig, and then he has also gained his Doctorate of the Philosophy of St. Thomas. Another studied at Leipzig, and he became a Doctor in Experimental Psychology, and he also gained his Doctorate of the Philosophy of St. Thomas Aquinas. Thus, all the Professors of the Institute of Philosophy are Doctors of the Philosophy of St. Thomas Aquinas, but each one has, as his own speciality, a Doctorate in some special branch of Science.

7415. The point I rather wanted to ascertain was one which you have practically answered. I understand that on these points the Philosophy of St. Thomas is not treated as final, but is presented for examination?—For examination—yes, to know what is to be rejected and what retained.

7416. And it is compared with modern systems?—Yes; all the systems of Kant, Hegel, Hume, Spencer, Renouvier, and so on, are expounded, and then compared with the Philosophy of St. Thomas.

7417. Are the Professors laymen or clerics?—Laymen and ecclesiastics.

7418. And as I understand you, several students who have gone through their courses at the Ecole St. Thomas were appointed Professors at this University?—Yes. Hitherto eight students, after having obtained the Doctorate in Philosophy of St. Thomas Aquinas, have been appointed to University Chairs, five at Louvain University, and three at the State Universities.

7419. I understand some of the lay students become Professors?—Yes; four of the eight University Professors of whom I spoke are laymen.

7420. What, otherwise, do they become?—They go to different pursuits; some study Law, some Medicine, some others take Sciences. Their chief aim is to take the general instruction.

7421. As I understand, the object is rather to do with reference to the present time what St. Thomas did with reference to his time—to attempt, to some extent, to co-ordinate the Sciences with Philosophy?—Yes; to see how far they can be co-ordinated; because, of course, some of his theories are to be abandoned or modified now, being untenable with Modern Science.

The Witness withdrew.

This concluded the Third Session of the Commission.

ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

DOCUMENTS.

I.

Document put in by Most Rev. Dr. O'Dwyer, Lord Bishop of Limerick.

MEMORANDA with reference to the proposed UNIVERSITY and COLLEGE.

(See the Evidence of Most Rev. Dr. O'DWYER, Appendix to First Report, qq. 793–7.)

The following Memoranda have been prepared in accordance with the suggestion of the Chairman of the Royal Commission on University Education, as a draft, not in detail, but, I should hope, an adequate draft of the plan of University reform, which I sketched in outline in my evidence.

It is, as I may remind the Commission, only one out of various ways in which the problem may be dealt with, yet I think that it is workable, and fairly meets the conditions of the case.

I have to add that while I am aware that in substance it is in harmony with the views of the Hierarchy generally, in its actual form and terms it is my own.

(1.) The suggestion is that a University should be set up in Dublin mainly for Catholics.

(2.) The Tests Act might apply to this University.

(3.) In constituting the governing body the general idea would be to make it representative of the University itself, which would thus be allowed to develop from within.

At the same time, in a new institution, it is obvious that representation should be given to permanent interests as well.

(4.) For these purposes the governing body might consist of—

(*a.*) A Chancellor,
(*b.*) A Vice-Chancellor, and,
(*c.*) Say, thirty ordinary members.

(*a.*) The Chancellor might be appointed by the Crown for life.

(*b.*) The Vice-Chancellor might be elected from amongst themselves, by the ordinary members of the Senate.

(*c.*) The ordinary members would, in the first instance, have to be named in a schedule, and would probably be all Catholics.

Future vacancies would be filled by appointment, or election, as the case may be, by the following:—

(1.) By the Crown, for life, as to, . .
(2.) By Catholic Bishops,* for life . .
(3.) By Faculties of the University for a term of years, ...
(4.) By Constituent Colleges, for a term of years, ...
(5.) By graduates for a term of years, .
(6.) †By Heads of Secondary Schools preparing students for Matriculation, for a term of years, . . .
(7.) Co-opted, for life, ...

The exact number representing each category would be a matter for future consideration.

It is to be hoped that eventually none but graduates of this University should be eligible for places on the governing body.

The governing body would have power to make all necessary statutes, and to provide due safeguards for faith and morals in accordance with Catholic principles, more or less corresponding to those that have been adopted for the protection of revealed religion in the Queen's Colleges.

COLLEGES.

(1.) Constituent Colleges would, in the first instance, be those named in a schedule, as, for instance, (*a.*) the new University College, Dublin, (*b.*) Maynooth, (*c.*) Queen's College, Cork, and, perhaps, Galway, reconstituted in a manner satisfactory to Catholics.

(2.) The governing body of the University would have power to admit, from time to time, other Colleges, as Constituent Colleges, provided always, that it is satisfied, after special inquiry, that such Colleges are entitled, by the number of their students, their equipment, their professorial staff, &c., to be regarded as University Colleges.

Similarly, the governing body might for a sufficient reason remove a College from the schedule of Constituent Colleges.

There would be no objection on the part of Catholics to any reasonable precaution being taken to prevent the admission of Colleges that are below University rank, or the improper exclusion of any that are already scheduled as Constituent Colleges.

TEACHERS.

The teachers of the University would be either appointed by the governing body of the University, or recognised by it.

Appointed teachers would be—

Professors, Fellows, Lecturers, } of new University College, Dublin.

(*a.*) Professors would be appointed by governing body, having regard to established reputation in any branch of learning.

They would hold office, during good behaviour, in accordance with the statutes.

There would be no objection on the part of Catholics to any provision which might be made to secure that none but competent men were appointed.

(*b.*) Fellows and Lecturers would be Collegiate appointments.

(*See* below for College.)

Recognised teachers would be those teachers, in Constituent or other Colleges, who should have been individually recognised by the Governing body of the University as teachers of the University.

FACULTIES.

There might be Faculties as follows:—

(*a.*) Theology,
(*b.*) Arts,
(*c.*) Law,
(*d.*) Medicine,
(*e.*) Science,
(*f.*) Agriculture,
(*g.*) Music, and
Such other Faculties as the Senate from time to time may constitute.

The Theological Faculty would not share in the public endowments of the University, nor be subject to the Tests Act.

* The Bishops' claim to representation rests also on the fact that they are the founders of the Catholic University of Ireland, which would be merged in the new University.

† I put this (6) down for consideration, but I am doubtful as to its expediency.

DEGREES.

The University would have power to confer all degrees that may now be conferred by any University in these kingdoms.

STUDENTS.

(1.) It may be found desirable, at first, and for a certain number of years, to follow the precedent of the new London University, and divide the students, according as they follow courses of study approved by the University, under teachers of the University, or not, into internal and external students, and to provide either common or separate examinations for their admission to the degrees of the University, and, if separate, taking care that the degree in both cases represents, as far as possible, the same level of knowledge and attainments.

WOMEN.

(1.) It would be desirable that the governing body of the University should have power to recognise Colleges for women, as Bedford College is by London University, and bring them into connection with the University.

Certain conditions as to number of matriculated students, staff, &c., should be complied with.

(2.) The courses of study in these Colleges might be taken as sufficient for Pass students, and, if the condition of a College justified it, even for Honours.

(3.) There seems to be no reason why women students looking for Honours might not be allowed to attend lectures in all the lay Colleges of the University.

(4.) The degrees of the new University for Catholics would be open to women, as to men, without religious distinction.

Should this provision be regarded as unsatisfactory for themselves by non-Catholic women, I think Trinity College, Dublin, might, not unreasonably, be asked to admit them to its degrees.

VISITORS.

On the Board of Visitors there might be two Bishops and two Judges of the High Court of Justice nominated by the Crown.

(NOTE.—The presence of the Bishops would be of importance for the information of the Board on any question which might arise as to Catholic doctrine or practice, and would be a guarantee to Catholic parents that the religious faith of their children would not be tampered with.

On the other hand, the presence of Judges would be an assurance to the general public that Professors and others would have all reasonable security in the tenure of their offices.

NEW UNIVERSITY COLLEGE, DUBLIN.

MEMORANDUM.

The general idea is that this College, at the seat of the University, should be as closely connected with the governing body of the University as would be consistent with its own healthy life, and domestic autonomy.

It would be administered by its own President and Fellows; but these would be appointed by the governing body of the University, who would also make statutes for its government.

The governing body of the University might, out of its funds, provide for the maintenance of the College—the payment of President, Fellows, Lecturers, and general up-keep; also for establishing Scholarships and Bursaries, &c.

COLLEGE.

(1.) At the seat of the University in Dublin there would be a residential College, which might be called "University College."

(2.) University College would be administered by a President, and Fellows (number to be determined).

(3.) The President would be a person of prudence, learning, and experience, and would be chosen by the governing body of the University, having regard to the College as a place of education, religion, learning, and research.

(4.) The Fellows would, in the first instance, probably be chosen from those existing Fellows of the Royal University who have been assigned as teachers to Stephen's-green College, and may be willing to accept the office of Fellow in the new University College.

(5.) Future vacancies would be filled after examination of candidates from amongst the graduates of the University, by the appointment by the governing body of the University of the candidates whom they should think best fitted for the office of Fellow, having regard to the College as a place of education, religion, learning, and research.

In making appointments to Fellowships regard should be had to the maintenance in the College of a sufficient number of Fellows in each of the faculties of the University.

(6.) The Fellows would teach in their respective faculties, and of their number, together with the President, would form a College Council, to be charged with the care of discipline, order, finance, &c.

(7.) The Test Act of 1871 would apply to the College; but nothing in it should prevent the governing body of the University, and the authorities of the College from making provision, corresponding with what is done in Trinity College, Dublin, for Protestant students, and in the Colleges of Oxford and Cambridge for Anglicans, for the due discharge by Catholic students residing within the College of their religious duties, and the instruction of those of them who were in *statu pupillari* in their religion.

(*a.*) Lecturers to assist the Fellows in teaching might be appointed.

(*b.*) The governing body of the University would have power to fix the salaries of President, Fellows, and Lecturers, to determine by statute the term and other conditions of tenure of their office, and, for sufficient reason, to dismiss them.

(*c.*) Fellows would be eligible for appointment as University Professors, and might hold both offices.

VISITOR.

The Visitor of the College might be the Catholic Archbishop of Dublin for the time being.

✠ EDWARD THOMAS,
Bishop of Limerick.

Limerick, 14*th December* 1901.

II.

Documents put in by T. P. Gill, Esq., Secretary of the Department of Agriculture and Technical Instruction for Ireland.

(1.)

ACT OF PARLIAMENT UNDER WHICH THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND WAS ESTABLISHED.

A.D. 1899.

(Agriculture and Technical Instruction (Ireland) Act, 1899). [62 & 63 Vict., Ch. 50.]

(See the evidence of Mr. T. P. Gill, q. 3940)

DOCUMENTS, II.

A.D. 1899.

ARRANGEMENT OF SECTIONS.

PART I.

DEPARTMENT OF AGRICULTURE AND OTHER INDUSTRIES AND TECHNICAL INSTRUCTION.

Section.
1. Establishment of Department of Agriculture.
2. Powers and duties of Agricultural Department.
3. Provision with reference to Inspectors of Fisheries.
4. Power to transfer other powers of Government Departments.
5. Powers of Department in relation to inquiries, experiments, &c.
6. Staff and remuneration and expenses.

PART II.

CONSULTATIVE COUNCIL, AGRICULTURAL BOARD AND BOARD OF TECHNICAL INSTRUCTION, AND FINANCIAL PROVISIONS.

7. Establishment of Council of Agriculture, Agricultural Board, and Board of Technical Instruction.
8. Constitution of Council of Agriculture.
9. Constitution of Agricultural Board.
10. Constitution of Board of Technical Instruction.
11. Duties of Council of Agriculture.
12. Duties of Agricultural Board.
13. Duties of Board of Technical Instruction.
14. Power to appoint committees.
15. Moneys placed at the disposal of Department.
16. Application of money.
17. Provision for Department appearing before Railway and Canal Commissioners and for prosecuting under 56 & 57 Vict., c. 56. s. 7.
18. Provision with respect to congested districts counties.
19. Contributions by local authorities.

PART III.

MISCELLANEOUS.

20. Style and seal of Department.
21. Proceedings of Department.
22. Transfer of officers and other persons.
23. Consultative Committee of Education.
24. Regulations ex officio members, and secretaries of Council of Agriculture and boards.
25. Accounts of Department.
26. Reports of Department.
27. Duration of office of members of council and boards and casual vacancies.
28. General provisions and restrictions as to Orders in Council.
29. Construction of Acts and documents.
30. Definitions.
31. Short title and extent of Act.
32. Commencement of Act.
33. Pending proceedings.
34. Saving of existing orders, bye-laws, &c.
35. Repeals.

SCHEDULES.

CHAPTER 50.

A.D. 1899.

An Act for establishing a Department of Agriculture and other Industries and Technical Instruction in Ireland, and for other purposes connected therewith. A.D. 1899.

[9th August, 1899.]

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

PART I.

DEPARTMENT OF AGRICULTURE AND OTHER INDUSTRIES AND TECHNICAL INSTRUCTION.

Establishment of Department of Agriculture.

1.—(1.) There shall be established a Department of Agriculture and other Industries and Technical Instruction for Ireland (in this Act referred to as "the Department"), with the Chief Secretary as President thereof, and a Vice-President appointed by and removable at the pleasure of one of Her Majesty's Principal Secretaries of State.

(2.) Subject to the provisions of this Act, any power or duty of the Department may be exercised or performed by the President or the Vice-President, or by any person appointed by the President to act on behalf of the Vice-President during the temporary absence of the Vice-President.

(3.) The office of Vice-President of the Department shall not render the person holding the same incapable of being elected or of sitting or voting as a member of Parliament, or avoid his election if returned, or render him liable to any penalty for sitting or voting in Parliament.

(4.) The Vice-President of the Department shall be ex officio a member of the Congested Districts Board for Ireland.

Powers and duties of Agricultural Department.

2.—(1.) There shall be transferred to the Department at such dates respectively as the Lord Lieutenant by Order appoints—

(*a.*) The powers and duties of the Lord Lieutenant (whether acting alone or by the advice of the Privy Council), the Chief Secretary and the Under Secretary to the Lord Lieutenant under the Diseases of Animals Acts, 1894 and 1896:

(*b.*) The powers and duties of the Lord Lieutenant acting by the advice of the Privy Council under the Destructive Insects Act, 1877, and the Fertilisers and Feeding Stuffs Act, 1893; — 57 & 58 Vict., c. 57. 59 & 60 Vict., c. 15.

(*c.*) The powers and duties of the Registrar-General for Ireland and the Irish Land Commission, with reference to the collection and publication of statistics relating to agriculture, and of returns of average prices of agricultural produce; — 40 & 41 Vict., c. 68. 56 & 57 Vict., c. 56.

(*d.*) The powers and duties of the Irish Land Commission under the Markets and Fairs (Weighing of Cattle) Acts, 1887 and 1891; — 50 & 51 Vict., c. 27.

(*e.*) The administration of the grant for Science and Art in Ireland; — 54 & 55 Vict., c. 70.

(*f.*) The administration of the grant in aid of technical instruction, as defined by the Technical Instruction Act, 1889, in Ireland;

(*g.*) The powers and duties of the Department of Science and Art in relation to any public building or institution in Ireland under their control, and also any property in Ireland held by or for the purposes of that Department; — 52 & 53 Vict., c. 76.

(*h.*) The powers and duties of the Commissioners of National Education in connection with the Albert Institution and the Munster Institution, and also all the property held by those Commissioners for the purposes of the said institutions; and

(*i.*) The powers and duties of the Inspectors of Irish Fisheries.

(2.) A copy of every Order of the Lord Lieutenant under this section shall be published in the *Dublin Gazette*.

Provision with reference to Inspectors of Fisheries.

3.—(1.) As from the date of the transfer in pursuance of this Act to the Department of the powers and duties of the Inspectors of Irish Fisheries, those Inspectors shall be transferred and attached to the Department as officers thereof, and the Department shall, so long as any two of them continue to hold office, assign to one of them the performance, in the name of the Department, of the duties of those Inspectors under the enactments of the Fisheries (Ireland) Acts, 1842 to 1898, specified in the First Schedule to this Act, and such other (if any) of the duties so transferred as may be declared by an Order in Council of the Lord Lieutenant to partake of a judicial character, and shall delegate to such Inspector such of the powers so transferred as are necessary for the performance of the duties so assigned.

(2.) So soon as one only of those Inspectors continues to hold office the Department shall assign to him or to one of the other officers of the Department the like performance of the said duties, and shall delegate to such Inspector or officer such powers as aforesaid.

(3.) Nothing in this Act shall affect any provision in the Fisheries (Ireland) Acts, 1842 to 1898, conferring a right of appeal in respect of any bye-law, rule, regulation, order, award, determination, judgment, decision, or definition under those Acts, or requiring the confirmation thereof.

(4.) Anything in the Fisheries (Ireland) Acts, 1842 to 1898, requiring any act to be done or application to be heard by more than one Inspector shall be repealed.

(5.) Rules for the purposes of this section shall be made by the Department subject to the approval of the Lord Chancellor.

Power to transfer other powers of Government Departments.

4.—(1.) The Lord Lieutenant may, with the consent of the Treasury, by Order in Council, transfer to the Department such powers and duties exercised and performed by any Government Department in Ireland as are conferred or imposed by or in pursuance of any Act, and appear to him to be of an administrative character, and to relate to any powers and duties similar or analogous to those by this Act transferred to the Department.

(2.) Where any powers and duties proposed to be transferred by an Order under this section are exercised and performed by any Department, not being a Department of the Irish Government, the Order shall not be made without the consent of such first-mentioned Department.

Powers of Department in relation to inquiries, experiments, &c.

5.—The Department may make, or cause to be made, or aid in making, such inquiries, experiments, and research, and collect, or aid in collecting, such information as they may think important for the purposes of agriculture and other rural industries.

Staff and remuneration and expenses.

6.—(1.) The Department may, with the consent of the Lord Lieutenant and the Treasury, appoint or employ a secretary, two assistant secretaries, one in respect of agriculture and one in respect of technical instruction, and such inspectors, instructors, officers, and servants as the Department may require.

(2.) There shall be paid out of money provided by Parliament to the Vice-President of the Department the annual salary of one thousand two hundred pounds, together with a residential allowance not exceeding the annual sum of one hundred and fifty pounds, and to the secretary, assistant secretaries, inspectors, officers, and servants of the Department such salaries or remuneration as the Department, with the sanction of the Treasury, may determine.

(3.) All expenses incurred by the Department in the exercise of their powers or the performance of their duties under this part of this Act, other than expenses incurred in relation to the Albert Institution and the Munster Institution, shall, save so far as they are otherwise provided for under any Act, to such amount as may be sanctioned by the Treasury, be paid out of money provided by Parliament.

PART II.

A.D. 1899.

CONSULTATIVE COUNCIL, AGRICULTURAL BOARD AND BOARD OF TECHNICAL INSTRUCTION, AND FINANCIAL PROVISIONS.

Establishment of Council of Agriculture, Agricultural Board, and Board of Technical Instruction.

7. For the purpose of assisting the Department in carrying out the objects of this Act there shall be established—

(*a.*) a Council of Agriculture;
(*b.*) an Agricultural Board; and
(*c.*) a Board of Technical Instruction.

Constitution of Council of Agriculture.

8.—(1.) The Council of Agriculture shall consist of the following members:—

(*a.*) Two persons to be appointed by the county council of each county (other than a county borough) in each province; and
(*b.*) A number of persons resident in each province equal to the number of counties (exclusive of county boroughs) in the province, to be appointed by the Department with due regard to the representation on the council of any agricultural or industrial organisations in the province.

(2.) For the purposes of this section the county of Cork shall be regarded as two counties, and four persons shall be appointed by the council of that county.

(3.) The members representing each province shall constitute separate committees on the Council and shall be styled the provincial committees of the respective provinces.

Constitution of Agricultural Board.

9. The Agricultural Board shall consist of the following members:—

(*a.*) Two persons to be appointed by the provincial committee of each province; and
(*b.*) Four persons to be appointed by the Department.

Constitution of Board of Technical Instruction

10. The Board of Technical Instruction shall consist of the following members:—

(*a.*) Three persons to be appointed by the county council of each of the county boroughs of Dublin and Belfast;
(*b.*) One person to be appointed by a joint committee of the councils of the several urban county districts in the county of Dublin; such committee to consist of one member chosen out of their body by the council of each such district;
(*c.*) One person to be appointed by the council of each county borough not above mentioned;
(*d.*) One person to be appointed by the provincial committee of each province;
(*e.*) One person to be appointed by the Commissioners of National Education;
(*f.*) One person to be appointed by the Intermediate Education Board; and
(*g.*) Four persons to be appointed by the Department.

Duties of Council of Agriculture.

11. The Council of Agriculture shall meet at least once a year for the purpose of discussing matters of public interest in connection with any of the purposes of this Act.

Duties of Agricultural Board.

12. The Agricultural Board shall advise the Department with respect to all matters and questions submitted to them by the Department in connection with the purposes of agriculture and other rural industries.

Duties of Board of Technical Instruction.

13. The Board of Technical Instruction shall advise the Department with respect to all matters and questions submitted to them by the Department in connection with technical instruction.

Power to appoint committees.

14.—(1.) The council of any county or of any urban district may appoint a committee for the purposes of this Part of this Act, consisting partly of members of their own body and partly of other persons.

(2.) Any two or more public bodies may, subject to regulations of the Department, appoint a joint committee for the purposes of this Part of this Act, with such representation thereon of each public body as, subject to the provisions of this Act, may be agreed upon or, in case of dispute, determined by the Department.

Moneys placed at the disposal of Department.

15. The following moneys shall be placed at the disposal of the Department for the purposes of this Part of this Act:—

(*a.*) The annual sum of seventy-eight thousand pounds directed to be paid to the Commissioners of National Education, out of the Local Taxation (Ireland) Account, by section three of the Local Taxation (Customs and Excise) Act, 1890; 53 & 54 Vict., c. 60.
(*b.*) Out of the annual income derivable from the surplus of the Irish Church Temporalities Fund, during a period of fifteen years from the commencement of this Act, the annual sum of seventy thousand pounds, and thereafter during each sub-

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sequent period of fifteen years such annual sum as in the opinion of the Treasury can be paid without impairing the security for any liabilities existing at the commencement of this Act upon that Fund.

Provided that if in the financial year ending on the thirty-first day of March one thousand nine hundred and one the Treasury are of opinion that the said sum of seventy thousand pounds cannot be paid without impairing the security for such liabilities in that year, there shall be paid such lesser sum as in the opinion of the Treasury can be paid without impairing such security.

54 & 55 Vict., c. 48.

(c.) That portion of the Sea and Coast Fisheries Fund reserved by the Purchase of Land (Ireland) Act, 1891, for expenditure elsewhere than in the congested districts counties, including all money due on foot of loans, and for interest, dividends, and other annual income payable on account of the same;

(d.) An annual sum of twelve thousand pounds, to be paid out of money provided by Parliament, as an equivalent for the salaries attached to the judgeships abolished or left vacant, and the savings effected by the abolition or consolidation of offices, in pursuance of the Supreme Court of Judicature (Ireland) (No. 2) Act, 1897;

60 & 61 Vict., c. 66.

(e.) Such sums as have up to the commencement of this Act been carried by the Treasury to a separate account, under section thirteen of the said Act of 1897, in respect of the salaries attached to the judgeships abolished or left vacant and the net savings in the said section mentioned;

(f.) An annual sum of six thousand pounds, to be paid out of money provided by Parliament, representing the amount of the expenses heretofore paid out of such money in connection with instruction given in Ireland in agriculture, exclusive of any such instruction given in elementary national schools; and

59 & 60 Vict., c. 41 61 & 62 Vict., c. 37.

(g.) All sums paid to the Local Taxation (Ireland) Account pursuant to the Local Taxation (Ireland) Estate Duty Act, 1896, which are not required for the purposes of the Local Government (Ireland) Act, 1898.

Application of money.

16.—(1.) The money placed at the disposal of the Department by this Part of this Act shall be applied for the purposes and in the proportions following:—

(a.) A capital sum which shall not, save with the concurrence of the Agricultural Board, exceed fifteen thousand pounds shall be applied for the purpose of providing suitable buildings, fittings, and appliances for the Royal Veterinary College of Ireland.

(b.) A capital sum which shall not, save with the like concurrence, exceed ten thousand pounds shall be applied for the purpose of purchasing and stocking additional land, and providing suitable buildings, fittings, and appliances in connection therewith for the Munster Institution.

(c.) The annual sum of fifty-five thousand pounds shall be divided into such portions as may be determined by the Department, with the concurrence of the Board of Technical Instruction, and of those portions—

(i.) One shall be distributed in proportion to their respective populations between the county boroughs, and shall be applied by the respective councils of those boroughs in aid of schemes, approved by the Department, for the purposes of technical instruction; and

(ii.) The other portion shall be applied, subject as regards any particular application to the concurrence of the Board of Technical Instruction, for the purposes of technical instruction elsewhere than in the county boroughs, and in making or aiding in making such inquiries and collecting or aiding in collecting such information as the Department may think important for the purposes of technical instruction.

(d.) The annual sum of ten thousand pounds shall be applied for the purposes of sea fisheries.

(e.) Such sums as may be required shall be applied for the payment of the salaries or superannuation allowances of any officers or persons formerly employed under the Commissioners of National Education and transferred to the Department in pursuance of this Act.

(f.) Such sums as the Department consider reasonable shall be applied for defraying the expenses for travelling and subsistence, when absent from home, of the members of the council, and of each board established by this Act.

(g.) The surplus remaining of the aforesaid money shall be applied, subject as regards any particular application to the concurrence of the Agricultural Board, for the purposes of agriculture and other rural industries or sea fisheries.

(2.) The determination of the portions into which the said annual sum of fifty-five thousand pounds is to be divided shall have effect for a period of three years from the commencement of this Act, and at the end of that period and of each subsequent period of three years a new determination may be made subject to the like concurrence as is provided by this section.

(3.) Any money not expended in any financial year upon the purposes to which the same is made applicable by or in pursuance of this section shall be accumulated and may be expended for those purposes in any subsequent year.

(4.) Any money accumulated under this section may be invested by the Department in any securities in which trustees are by law for the time being authorised to invest trust moneys.

(5.) Money to be applied by the Department under this Part of this Act shall be applied subject to any conditions which the Department may require.

(6.) The Department shall not, in the absence of special considerations, apply or approve of the application of money under this section (other than the capital sums in this section mentioned) to schemes in respect of which aid is not given out of money provided by local authorities or from other local sources.

Provision for Department appearing before Railway and Canal Commissioners and for prosecuting under 56 & 57 Vict., c. 56, s. 7.

17.—(1.) The Department may take such steps as they think proper—

(a.) for appearing as complainant on behalf of any persons aggrieved in reference to any matter (other than a matter affecting the Postmaster-General) which the Railway and Canal Commissioners have jurisdiction to hear and determine; and

(b.) for instituting prosecutions under section seven of the Fertilisers and Feeding Stuffs Act, 1893.

(2.) Any expenses incurred by the Department under this section shall be paid out of the money placed at their disposal by this Part of this Act for the purposes of agriculture and other rural industries.

Provision with respect to congested districts counties.

18. The Department may at the request of the Congested Districts Board for Ireland exercise and discharge any of the powers and duties of that Board in or in relation to a congested districts county, where the expenses thereby incurred are defrayed out of money provided by that Board or by local authorities or from other local sources; but no money placed at the disposal of the Department by this Part of this Act shall be applied in or in relation to a congested districts county.

Contributions by local authorities.

19.—(1.) The council of every county (other than a county borough) may, in addition to any existing power, raise equally over the whole of the rural districts comprised in the county, by means of the poor rate, a sum not exceeding, in any one local financial year, a sum equal to a rate of one penny in the pound on the rateable value of such rural districts at the beginning of that year, and may apply the same for the purposes of agriculture and other rural industries, or for any other purpose for which they are authorised by or in pursuance of this Act to expend money.

52 & 53 Vict., c. 76. 54 & 55 Vict., c. 4.

(2.) Notwithstanding anything in the Technical Instruction Acts, 1889 and 1891, the rate raised for the purposes of those Acts in a rural district may, if the county council think fit, be applied under this section for any of the purposes of agriculture and other rural industries not included in the said Acts.

41 & 42 Vict., c. 52.

(3.) The council of every urban district may, in addition to any existing power, raise by means or out of any rate or fund applicable for the purposes of the Public Health (Ireland) Act, 1878, and, in the case of a rate, assessed in the manner provided by that Act, a sum not exceeding in any one local financial year a sum equal to a rate of one penny in the pound on the rateable value of the urban district at the beginning of that year, and may apply the same for the purposes of technical instruction, or for any other purpose for which they are authorised by or in pursuance of this Act to expend money.

(4.) No money shall be applied under this section save—

(a.) In accordance with the provisions of a scheme approved by the Department; or

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(*b.*) for defraying any administrative or incidental expenses incurred, with the approval of the Department, for the purposes of this Act.

(5.) A county or urban district council may borrow for the purposes of this Act—

(*a.*) In the case of a county council as if those purposes were purposes for which they are authorised to borrow under the Order in Council under section one hundred and four of the Local Government (Ireland) Act, 1898;

61 & 62 Vict., c. 37.

(*b.*) In the case of an urban district council as if those purposes were purposes for which they are authorised to borrow under the Public Health (Ireland) Act, 1878.

41 & 42 Vict., c. 52.

PART III.

MISCELLANEOUS.

Style and seal of Department.

20.—(1.) The Department shall be a body corporate with a capacity to acquire and hold land for the purposes of this Act, and shall be styled "The Department of Agriculture and Technical Instruction for Ireland," and may sue and be sued by that name.

(2.) The Department shall have an official seal, which shall be officially and judicially noticed, and such seal shall be authenticated by the signature of a member of the Department or of the secretary, or some person authorised by the Department to act on behalf of the secretary.

(3.) In the execution or performance of any power or duty transferred to the Department by or in pursuance of this Act, the Department shall adopt and use the style and seal of the Department.

Proceedings of Department.

21.—(1.) Every document purporting to be an order, licence, certificate, or other instrument issued by the Department, and to be sealed with the seal of the Department, authenticated in manner provided by this Act, or purporting to be signed by the secretary or any person authorised by the Department to act on behalf of the secretary, shall be received in evidence and be deemed to be such order, licence, certificate, or instrument without further proof, unless the contrary is shown.

(2.) A certificate signed by any member of the Department or by any person appointed by the Department to act on their behalf that any order, licence, certificate, or other instrument purporting to be made or issued by the Department, is so made or issued, shall be conclusive evidence of the fact so certified.

(3.) The Documentary Evidence Act, 1868, as amended by the Documentary Evidence Act, 1882, shall apply to the Department in like manner as if the Department were mentioned in the first column of the schedule to the first-mentioned Act, and a member of the Department, or the secretary of the Department, or any person authorised by the Department to act on behalf of the secretary of the Department, were mentioned in the second column of that schedule, and as if the regulations referred to in those Acts included any document issued by the Department.

31 & 32 Vict., c. 37.
45 & 46 Vict., c. 9.

(4.) Section one of the Rules Publication Act, 1893, shall not apply to any rules made by the Department under the Diseases of Animals Acts, 1894 and 1896.

56 & 57 Vict., c. 66.
57 & 58 Vict., c. 57.
59 & 60 Vict., c. 15.

Transfer of officers and other persons.

22.—(1.) There shall be transferred and attached to the Department as officers thereof such of the persons employed under the Lord Lieutenant, the Privy Council, or any other Government Department, in or about the execution and discharge of the powers and duties transferred by or in pursuance of this Act to the Department as the Lord Lieutenant may, with the sanction of the Treasury, determine.

(2.) The Department may, subject to the provisions of this Act, distribute the business of the Department among the persons transferred thereto in pursuance of this Act, or hereafter appointed officers of the Department, in such manner as the Department may think right, having regard to the duties previously performed by those officers, and those persons shall perform such duties in relation to that business as may be directed by the Department: Provided that any persons transferred from any Government Department under this section shall, while they continue in office, be in no worse position as respects tenure of office, salaries, or superannuation allowances than they would have been in if this Act had not passed.

(3.) Any Order in Council of the Lord Lieutenant made in pursuance of this Act which transfers any powers or duties to the Department shall extend this section to such of the persons employed in or about the execution and performance of those powers and duties as the Lord Lieutenant may determine.

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Consultative Committee of Education.

23. For the purpose of co-ordinating educational administration, there shall be established a Consultative Committee consisting of the following members:—

(*a.*) The Vice-President of the Department, who shall be chairman thereof;

(*b.*) One person to be appointed by the Commissioners of National Education;

(*c.*) One person to be appointed by the Intermediate Education Board;

(*d.*) One person to be appointed by the Agricultural Board; and

(*e.*) One person to be appointed by the Board of Technical Instruction.

Regulations, ex-officio members, and secretaries of council of agriculture and boards.

24.—(1.) The Department may make general regulations for regulating the proceedings for the appointment of the members of the council and of each board established by this Act, and the number of meetings, the proceedings and quorum of such council and boards, and the appointing body, council, or board shall act in accordance with those regulations.

(2.) The President and Vice-president of the Department shall be ex officio members of such council and of each such board, but shall not, save as hereinafter provided, vote at any meeting of such council or boards.

(3.) The President of the Department, or in his absence the Vice-president, may take the chair at any such meeting, and in such case shall have a casting vote.

(4.) In the absence of the President and Vice-president of the Department from any such meeting, any officer of the Department appointed by the President or Vice-president may attend the meeting.

(5.) The Department may require any of their own officers to act as secretaries or other officers of the council or boards established by this Act.

Accounts of Departments.

25. The Department shall prepare, in such form and at such times as the Treasury may direct, accounts of the receipts and expenditure of the Department, and within six months after the expiration of the financial year to which the accounts relate shall transmit the same to the Controller and Auditor-General to be audited, certified, and reported upon in conformity with regulations made by the Treasury, and the accounts, with the reports of the Controller and Auditor-General thereon, shall be laid before the House of Commons as soon as may be after the reports are made.

Reports of Department.

26. The Department shall once in every year, as soon as possible after the close of the financial year, make reports to the Lord Lieutenant as to their proceedings under this Act, and all such reports shall be laid before Parliament.

Duration of office of members of council and boards and casual vacancies.

27.—(1.) The members of the council and of each board established by this Act shall hold office for terms of three years (the first whereof shall date from the commencement of this Act), and may be re-appointed.

(2.) A member of such council or boards may resign office by giving notice of resignation to the secretary of the council.

(3.) If any person is appointed a member of such council or boards by more than one appointing body, he may elect which appointing body he will represent on the council or board.

(4.) A casual vacancy occurring through death, resignation, or otherwise in the office of member of such council or boards may be filled by the appointment of a person qualified in the same manner (if any) as the person whose office is vacant, by the authority or committee by whom the person whose office is vacant was appointed.

(5.) A person appointed to fill a casual vacancy shall retire from office at the same time as the person whose office is vacant would have retired.

General provisions and restrictions as to Orders in Council.

28.—(1.) An Order of the Lord Lieutenant in Council under this Act unless annulled as hereinafter mentioned shall be deemed to have been duly made, and to be within the powers conferred by this Act, and no objection to the validity thereof shall be taken in any proceedings.

(2.) The Order shall be laid before both Houses of Parliament as soon as may be after it is made, and if within the next subsequent forty days on which either House has sat that House presents an address to Her Majesty praying that any such Order may either in whole or in part be annulled, Her Majesty in Council may annul the same either in whole or in part as the case may require, and the Order or part so annulled shall thenceforth become void without prejudice to the validity of any proceedings taken under the same in the meantime:

Provided that where any Order or any part thereof is so annulled the Lord Lieutenant in Council may within six months thereafter make another Order in place of the Order or part so annulled, subject nevertheless, to be laid before Parliament, and to be annulled by Her Majesty in Council in the manner above mentioned, and so on as often as occasion requires.

(3.) This section shall apply, with the necessary modifications, to any rules or regulations of the Department under this Act.

Construction of Acts and documents.

29.—(1.) All enactments, orders, instruments, contracts, and other documents relating to any powers or duties transferred by or in pursuance of this Act from any authority to the Department shall, so far as circumstances admit, be construed as if any reference therein to the said authority, so far as it relates to the said powers and duties referred to the Department, and shall be construed with such modifications as may be necessary for carrying this Act into effect, and any act or thing which, but for this Act might have been done by, to, or before any such authority, for the purpose of, or in connection with the said powers and duties may be done by, to, or before the Department.

(2.) The expression "authority" in this section means the Department of Science and Art, the Lord Lieutenant (whether acting alone or by the advice of the Privy Council), the Chief Secretary, the Under Secretary to the Lord Lieutenant, the Irish Land Commission, the Registrar-General for Ireland, the Inspectors of Irish Fisheries, the Board of National Education, and any other Government Department, or board of commissioners whose powers or duties are transferred by or in pursuance of this Act.

Definitions.

30.—(1.) In this Act, unless the subject or context otherwise requires:—

The expression "the purposes of agriculture and other rural industries" includes the aiding, improving, and developing of agriculture, horticulture, forestry, dairying, the breeding of horses, cattle, and other live stock and poultry, home and cottage industries, the cultivation and preparation of flax, inland fisheries, and any industries immediately connected with and subservient to any of the said matters and any instruction relating thereto, and shall also include the aiding or facilitating of the carriage and distribution of produce:

The expression "the purposes of sea fisheries" includes the construction of piers and harbours, the supply of fishing boats and gear, investigation into the habits of fish and methods of fishing, instruction in fishing, the encouragement of any industries immediately connected with and subservient to fishing, the supervision and protection of fishing grounds, and the enforcement of bye-laws relating to fishing:

The expression "technical instruction" means instruction in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments. It shall not include instruction given in elementary schools or teaching the practice of any trade or industry or employment, but save as aforesaid shall include instruction in the branches of science and art with respect to which grants are for the time being made by the Department, and any other form of instruction (including modern languages and commercial subjects) which may for the time being be sanctioned by the Department, by a minute laid before Parliament and made on the representation of a county or urban district council that such form of instruction is required by the circumstances of its district, and shall also include instruction in the use of tools, and modelling in clay, wood, or other material:

The expression "rateable value," when used in relation to any area, means the annual rateable value under the Irish Valuation Acts of the hereditaments comprised in such area:

54 & 55 Vict., c. 48.

The expression "congested districts county" has the same meaning as in the Purchase of Land (Ireland) Act, 1891:

The expression "public body" means any corporation, council, board of commissioners, or committee constituted by or in pursuance of any Act, or any association constituted by any Act or charter:

The expression "powers" includes rights, jurisdiction, capacities privileges, and immunities:

The expression "duties" includes responsibilities and obligations:

44 & 45 Vict., c. 71.

The expression "the Irish Church Temporalities Fund" means the fund under the control of the Irish Land Commission by virtue of the Irish Church Act Amendment Act, 1881:

The expression "the Albert Institution" means the Albert Agricultural and Dairy Training Department at Glasnevin:

The expression "the Munster Institution" means the Munster Dairy School and Agricultural Institute:

(2.) The Mussels, Periwinkles, and Cockles (Ireland) Act 1898, may be cited with the Fisheries (Ireland) Acts, 1842 to 1895.

61 & 62 Vict., c. 28.

Short title and extent of Act.

31. This Act may be cited as the Agriculture and Technical Instruction (Ireland) Act, 1899, and shall extend to Ireland only.

Commencement of Act.

32. Subject as in this Act mentioned this Act shall come into operation on the first day of April next after the passing thereof: Provided that the Vice-president of the Department may be appointed at any time after the passing of this Act and the Department shall thereupon be deemed to be established.

Pending proceedings.

33. All proceedings affected by any powers or duties transferred by or in pursuance of this Act to the Department, and which are pending at the date of such transfer, may be continued and concluded as if such transfer had been made before the proceedings were instituted.

Saving of existing orders, bye-laws, &c.

34. All Orders in Council of the Lord Lieutenant in relation to the powers and duties transferred by this Act and all bye-laws, orders, rules, regulations and definitions of the Inspectors of Irish Fisheries in force at the commencement of this Act shall continue in force until revoked or altered by the Department.

Repeals.

35. The Acts specified in the Second Schedule to this Act are hereby repealed to the extent mentioned in the third column of that schedule, but as respects the Fisheries (Ireland) Acts, 1842 to 1895, and the Diseases of Animals Act, 1894, the repeal shall not have effect until the respective dates appointed by order of the Lord Lieutenant for the transfer of powers and duties under those Acts.

SCHEDULES.

Section 3.

First Schedule.

ENACTMENTS OF FISHERIES (IRELAND) ACTS, 1842 TO 1898, IMPOSING JUDICIAL DUTIES.

Session and Chapter.	Short Title.	Enactments referred to.
5 & 6 Vict., c. 106.	The Fisheries (Ireland) Act, 1842.	Section twenty-six.
8 & 9 Vict., c. 108.	The Fisheries (Ireland) Act, 1845.	Section three.
13 & 14 Vict., c. 88.	The Fisheries (Ireland) Act, 1850.	Sections fourteen and fifty-four.
26 & 27 Vict., c. 114.	The Salmon Fisheries (Ireland) Act., 1863.	Sections five, six, seven, eleven, and sixteen.
29 & 30 Vict., c. 97.	The Oyster Fishery (Ireland) Amendment Act, 1856.	Sections five, six, ten, fourteen, and fifteen.
32 & 33 Vict., c. 9.	The Salmon Fishery (Ireland) Act, 1869.	Section four.
32 & 33 Vict., c. 92.	The Fisheries (Ireland) Act, 1869.	Sections fourteen and sixteen.
47 & 48 Vict., c. 48.	The Oyster Cultivation Act, 1884.	Sections two to six, ten, and sixteen.
61 & 62 Vict., c. 28.	The Mussels, Periwinkles, and Cockles (Ireland) Act, 1898.	Sections four and five.

Section 35.

Second Schedule.

ACTS REPEALED.

Session and Chapter.	Short Title.	Extent of Appeal.
26 & 27 Vict., c. 114.	The Salmon Fisheries (Ireland) Act, 1863.	Sections thirty-three and thirty-five.
29 & 30 Vict., c. 88.	The Oyster Beds (Ireland) Act, 1866.	Section four.
32 & 33 Vict., c. 9.	The Salmon Fishery (Ireland) Act, 1869.	Section two.
32 & 33 Vict., c. 92.	The Fisheries (Ireland) Act, 1869.	Section six, section seven from "and any one" to the end of the section, section nine.
53 & 54 Vict., c. 60.	The Local Taxation, Customs, and Excise Act, 1890.	Section three from "to "the Commissioners" to "hereinbefore mentioned," and from "Expressions" to the end of the section, being sub-section two.
57 & 58 Vict., c. 57.	The Diseases of Animals Act, 1894.	Section sixty-five from "Any Act" to "being to "the Lord Lieutenant," being sub-sections two and three. Section seventy-six from "A copy of" to "publication of the order," being sub-sections two and three.
60 & 61 Vict., c. 66.	The Supreme Court of Judicature (Ireland) (No. 2) Act, 1897.	Section thirteen.

(2.)

PROGRAMME OF EXPERIMENTAL SCIENCE, DRAWING, AND MANUAL INSTRUCTION IN SECONDARY SCHOOLS, 1901–2, ISSUED BY THE DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND.

(See the evidence of Mr. T. P. Gill, q. 3965).

I.—EXPLANATORY CIRCULAR TO MANAGERS AND HEAD TEACHERS OF SECONDARY SCHOOLS.

UPPER MERRION STREET, DUBLIN,
April, 1901.

SIR OR MADAM,

Under Section 2 (1) (*e*) of the Agriculture and Technical Instruction (Ireland) Act, 1899, the administration of the Grant for Science and Art in Ireland is to be transferred to this Department from 1st April, 1901.

This Grant, which has hitherto been administered by the Board of Education, South Kensington, is, as you are doubtless aware, an Annual Parliamentary Vote, variable in amount in accordance with the extent to which the instruction in Science and Art is adopted; and it includes provision for aid towards the cost of the apparatus and equipment necessary for the teaching of these subjects in schools. The Grant is not to be confounded with the funds placed at the disposal of the Department for the purposes of Technical Instruction, in accordance with the provisions of Section 16 (1) (*c*) (ii.) of the Agriculture and Technical Instruction (Ireland) Act, 1899; nor with the Grant in aid of Technical Instruction which is available when Local Authorities raise rates under the Technical Instruction Act of 1889.

The Department, in taking over the Science and Art Grant, feel that the methods of assessing it might with advantage be changed, in order to render it more directly applicable to existing educational needs in Ireland. They have accordingly prepared new Regulations for the administration and distribution of Grants for Experimental Science, Drawing, and Manual Instruction in Secondary Schools. These Regulations, together with suggested Syllabuses, are enclosed herewith.

In the main, the new Regulations form a scheme of payments, based on the results of inspection, for instruction in Experimental Science, Drawing, and Manual Work, or Household Economy.

The Department do not consider it advisable to issue a detailed programme of study which all Schools should follow. They believe rather that the variety of arrangements (made possible by what is considered an elastic system of payments) no less than the variety of Schools, will lead to variety of programme; and it is hoped that in this way opportunities will be afforded to each School to stamp its individuality on the character of the instruction. I am to say, therefore, that within certain limits, such as that the subject must be taught practically (as defined later on), that Physics must precede Chemistry, and that the general character of the suggested Syllabus must be adhered to, Managers will be allowed considerable latitude in modification of details.

Again, as the number of hours per week to be devoted to the work will greatly vary, much latitude will also be permitted in the amount of work expected from a School. At first the Scheme will be treated as tentative, and the work for the first year, at least, will be regarded as an experiment. The work will be tested by inspection, without notice, usually; but, towards the close of the School year, the Inspector will give notice of his visit of final inspection for that year. At such visits, but especially on the visit of final inspection, it will be within the discretion of the Inspector to test any or all of the classes by practical exercises in the laboratory, or by *viva voce* examination of classes or of individuals, or by written examinations, or by a combination of these methods.

You will observe that the Grants to be paid may be increased by one-tenth or reduced by one or more tenths, as the Department may determine on receipt of the Inspector's Report. Reduction by more tenths than one will be exceptional. The Department would prefer, in cases where such exceptional treatment was necessary, to give a School reasonable warning, and, unless marked improvement followed, to remove such School from the list of those aided by the proposed system of Grants.

In many Schools one laboratory will be sufficient. It will be necessary to have laboratories approved, and, in cases where application is to be made for a grant for fittings or for apparatus, the plans of the laboratory and the details of the apparatus should be submitted to the Department for approval before the laboratory is built or equipped and before the apparatus is purchased.

The Department regard the question of the qualification of teachers as of the utmost importance. They have arranged that increased opportunities for the training of qualified teachers shall be available at the Royal College of Science, and they will, by means of Summer Courses, assist Schools in this particular as far as possible. But it must be fully understood that a three weeks' or a month's Summer Course alone is not sufficient to qualify a teacher to give such instruction as the Department contemplate, and further, that none but properly qualified teachers of Science, Drawing, Manual Instruction and Household Economy will be recognised. The Degree of any University, or the Diploma of any approved Technical College, where Physics and Chemistry are part of the Degree or Diploma Course, or First Class Certificates in the Advanced Stages of any two Physics subjects (see Science and Art Directory) *and of* Inorganic Chemistry, will, for a time, be recognised as qualifying to teach Science in Secondary Schools, but the Department will, at the earliest convenient moment, require proof that the teachers have also had a practical Course in an approved Laboratory.

The Teacher's Elementary Drawing Certificate is the lowest qualification that will be recognised for a Teacher of Drawing, and it is hoped that in a short time it may be found convenient to raise the standard of qualification to that of the Art Class Teacher's Certificate. (See Science and Art Directory.)

The Diploma of the London City and Guilds' Institute will be the recognised qualification for a Teacher of Manual Instruction.

The Department will be prepared to consider cases of exceptional qualification and to offer facilities (on certain conditions to be obtained on application) for the examination of teachers who do not hold the recognised certificates, but who consider themselves competent to teach the subjects referred to.

Schools proposing to give instruction of the character described, must submit annually before the 15th August, on forms to be obtained from the Department, a time table of the School, a statement of the qualifications of the teachers to be employed, and of the course to be followed.

It will not be necessary that the Course of Instruction should be taken up by all the pupils in a School; but no grant will be paid on a pupil of the Second Year's Course unless he has taken up the work of the first year, and so on.

During the first year or so (*i.e.*, in what must be a transition period) the Department will, as far as possible, assist Schools in overcoming the initial difficulties so long as the character and aims of the instruction are not seriously interfered with.

I am to add that arrangements have been made with the Intermediate Education Board for Ireland whereby the Board adopt the Department's Programme in Experimental Science and Drawing. (See accompanying copy of the Resolution adopted by the Intermediate Education Board.) The Details of the arrangements by which Schools and Pupils may obtain credit, under the regulations of the Intermediate Education Board, for proficiency in Experimental Science and Drawing will be published in due course.

I am,
Sir or Madam,
Your obedient Servant,
T. P. GILL,
Secretary.

II.—Resolution Adopted by the Intermediate Education Board for Ireland at their Meeting on Thursday, 21st February, 1901.

Resolved:—

"That the Board adopt the Programme in Science and Drawing set forth in the 'Suggested Syllabus' prepared for Secondary Schools by the Department of Agriculture and Technical Instruction for Ireland.

"That Natural Philosophy, Chemistry, and Drawing be replaced in our Programme by one subject, viz., 'Experimental Science and Drawing,' and that after the present year, until a year's notice shall have been given by us, we shall not hold any examinations in this subject, but shall accept the inspection and, where necessary, the examination of the Department."

[Note.—The Intermediate Education Board have under consideration the question of exhibitioners whose interests may be prejudiced by the changes in the regulations regarding Science and Drawing.]

III.—Regulations for the Administration and Distribution of Grants for Experimental Science, Drawing, and Manual Instruction in Secondary Schools in Ireland.

I.

Grants in respect of courses of instruction in Experimental Science, Drawing, Manual Instruction, and Household Economy, may be made in accordance with the following regulations to Secondary Schools, where provision is made for instruction in the other main branches of a general education:—

(1.) Grants shall be payable only on Students over twelve years of age (on or before the 1st day of June in the calendar year in which the course is entered on) who have completed an education which would entitle them to be placed in the Sixth Class of a School under the Board of National Education in Ireland.

(2.) Grants shall be payable to those Day Schools only in which the course of instruction has been approved by the Department.

(3.) The minimum number of hours devoted to instruction in Science and Drawing shall be four hours per week, of which three shall be given to Science and one to Drawing.

(4.) The minimum duration of an approved course shall be two years.

II.

(1.) Experimental Science shall mean such a system of instruction in Physical and Natural Science as will involve the greater part of the work being done by the pupils themselves in an approved laboratory.

Drawing must include Freehand, and may include Mechanical Drawing (with Practical Geometry) and Modelling.

Manual Instruction shall include instruction in the use of tools employed in Wood or Metal Working.

Household Economy may include Cookery, Laundry Work, Dressmaking, and any other form of practical instruction in household management of which the Department may approve.

(2.) Managers of Schools may submit their own courses of instruction in these subjects for the approval of the Department.

(3.) Grants may be made on the average attendance of duly qualified pupils for each hour per week of instruction throughout the School Year, according to the following scale:—

Experimental Science—10*s.* for the first year of the course; 12*s.* 6*d.* for the second year of the course; 15*s.* for the third or fourth year of the course.

Drawing—5*s.* for the first year of the course; 6*s.* for the second year of the course; 7*s.* for the third or fourth year of the course.

Manual Instruction and Household Economy—6*s.* for the first year of the course; 7*s.* for the second year of the course; 8*s.* for the third or fourth year of the course.

(4.) The numbers on which grants for each subject are to be calculated, at the foregoing rates, shall be determined by adding together the total number of hours of attendance made by each pupil in that subject (at the approved time table hours) and dividing by forty, the normal School Year being regarded as of forty weeks.

III.

(A.) In Schools in which a fair proportion of pupils remain three or four years, the course shall consist of at least Experimental Science and Drawing. Not less than three hours per week shall be devoted to Experimental Science, and one to Drawing. If more than six hours per week are devoted to Science and Drawing, Manual Instruction or Household Management shall also form part of the course; and, in that case, at least one and a half hours shall be devoted to either of these subjects.

(B.) 1. In Schools in which the majority of the pupils remain only two years, Manual Instruction or Household Economy, with Experimental Science and Drawing, shall constitute the course.

2. In certain cases Practical Mathematics and Mechanical Drawing may be substituted, with the sanction of the Department, for Experimental Science, the grants being in such cases the same as those for Drawing.

3. The minimum number of hours per week for a two years' course shall be six.

IV.

(1.) No scheme will be approved unless the Department are satisfied that due provision is made for the instruction of the pupils in the other main branches of a general education.

(2.) No grant will be made for instruction unless due provision is made for experimental work in Science on the part of the pupils, in properly-equipped and approved laboratories.

(3.) Not more than forty pupils shall be taken at a time by one teacher, for Theoretical Instruction in any subject, nor more than twenty for Practical Instruction in Science, unless an Assistant is provided, in which case the number may be increased to thirty.

(4.) Practical Instruction in Science must be given in lessons of at least eighty minutes' duration. The time table of the School must be arranged so as to leave sufficient time to the Science Master for preparation of laboratory work.

(5.) The qualification of the Teacher and the time table of the School must be approved by the Department.

(6.) The grant to be made in respect of any course, in accordance with the foregoing regulations, may, in exceptional cases, be increased by one-tenth when the Inspector of the Department is of opinion that the work is of conspicuous merit. It may also be reduced by one or more tenths on the ground of unsatisfactory work, or for defects of equipment or of organisation, or for any other cause which may tend to lessen the efficiency of the work done.

(7.) It shall be a condition of grants being made, that, except in the case of teachers who give their services gratuitously, a fixed salary shall be paid to the teachers of the classes, either in respect of these classes or of their work in the School as a whole; that a reasonable sum of money shall be provided for the upkeep of the premises; and that the grants obtained shall be paid into the School account and be used for improving the efficiency of the School.

V.

1. Grants will only be made upon a satisfactory report by an Inspector of the Department. The Inspector must satisfy himself not only that the attendances on which the claim is based have actually been made, but also that the instruction is of a class superior to that admitted in Elementary Schools.

VI.

1. The course of instruction should begin in August or September of any year, and should be continuous throughout the school year. The hours per week devoted to the course must be fairly distributed throughout that school week. In exceptional circumstances, where *previous* application has been made, the Department may sanction another arrangement. Deviations from the approved time table, unless *previously* sanctioned, will be regarded as a serious irregularity.

2. Lessons of less than forty minutes' duration will *not* be considered in computing the "total number of hours of attendance" under II (4).

3. Attendance registers will be supplied by the Department; attendances not registered in the manner indicated on the official registers will be disregarded.

4. That portion of the income of a School which is derived from Grants in accordance with these Regulations must be applied to such purposes as shall be approved by the Department. If at any time it appears that the application of the income is unsatisfactory, the assistance of the Department may be withdrawn. An account of the receipts and expenditure of each School in respect of these Grants must be furnished to the Department annually, on a form to be had from the Secretary.

5. The Department reserve the right to withhold grants under these regulations from any School conducted for private profit in which the fees are, in the Department's opinion, excessive, or which is situated in a locality already sufficiently supplied with public institutions.

6. The decision of the Department in all questions arising in connection with the payment of Grants under this scheme must be final.

IV.—COURSE IN SCIENCE.

I.—PREFATORY NOTE.

The committing of facts to memory, however important or useful, is not Science teaching; and it is hoped, therefore, that during at least the first two years of the course the text-book will occupy a very small (if any) share in the work of instruction. The object in view is the introduction of the scientific method of Science teaching as a means of mental discipline; and it is because the methods and spirit of the teaching cannot be measured by the ordinary form of written examination, that the annual written tests have been abandoned in favour of inspection.

The principles underlying the scientific method are (1) careful and accurate collection of facts, (2) observation of the inter-relation and sequence of facts, (3) construction and testing of hypotheses to account for facts; and it is possible, even in the simplest exercises, to have due regard to these principles. To the scientific method, the mere *telling*, or *learning*, of facts is therefore opposed. The work is to be practical, and by this is meant the working out of the exercises by the pupils themselves. The business of the teacher is to shape his course of instruction by exercises chosen on some definite plan; to instruct his pupils how to measure and weigh accurately, and, in general, how to collect the results of their observations; and to assist them in arriving at correct conclusions. Results should, as far as possible, be tested in more ways than one; and the pupils should gradually gather confidence in their own observations, so that, whether hopeful or not as to the correctness of their conclusions, they should have complete confidence in the accuracy of their facts.

As far as possible, the "research" method should be adopted even in the earliest exercises; but the teacher will probably find that at one time the "research" method, and at another the method of "verification" will best serve the interests he has at heart, and carry along his work without undue loss of time. Instructions as to the carrying out of exercises will necessarily *precede* the actual measurements, weighings, and so on; but the drawing of conclusions, the driving home, so to say, of the meaning of the facts, will *follow* laboratory practice. To this end the class should be "kept together." Much of the value of this kind of teaching is lost in the case of young pupils if individuals are allowed to "go on."

Pupils may be allowed to work in pairs, but not in groups of three or four. Careful consideration of the exercises, with a view to such modification of details as will reduce the duplication of sets of apparatus will, therefore, be demanded of the teacher. The apparatus used should be as simple and inexpensive as possible. At the present moment it is not proposed to issue a list of necessary apparatus; the choice is left to individual Schools. But one balance (costing from 30*s.* to 40*s.*) will be necessary during the first two years for each pair of pupils in any one laboratory class. Afterwards a few more delicate balances will be required.

A word about the exercises themselves may be useful. In the measurements of length, area, and volume, the attention of the pupil should not be confined to small objects. The metre stick, the foot rule, the yard stick, a tape, and, where available, a surveyor's chain, should all be used; the circumference of a small coin, of a circle of large dimensions; the area of an envelope, of a pane of glass, of the surface of the working bench or of the floor; the volumes of flasks, and of vessels of large size, such as pails, barrels, and even cisterns, should all be measured in English and metric units. In a word, the scale of the exercises should be largely varied, and the pupils should learn through experience the limits of accuracy imposed and the consequent reduction of arithmetical labour. No calculation should be carried further than the number of decimals in the least accurate factor of it. Where the experimental error is clearly not less than 1 per cent. it is at least a waste of time to produce an answer containing seven or eight decimal places.

Again, an exercise like the finding of the weight of 1 c.c. of water, should be determined under various conditions of temperature (not exactly noted, say, hot, warm, cold), the results of the whole class when tabulated would indicate the influence of temperature, and open the way for the later consideration of expansion.

The record of the exercises is only less important than the exercises themselves. A laboratory book of uniform size, and with a fair proportion of pages of squared paper should be in the possession of every pupil. The method of performing an exercise should be described in a few sentences, the apparatus should be neatly sketched, and the results of observations entered in ink (arithmetical results tabulated in ink) at the time of working the exercise. The carrying of the results of weighing or of measurement and so on "in the head," or the writing of results on scraps of paper not only lead to loss and consequent waste of time, but will also counteract those habits of neatness and accuracy which are regarded as essential characteristics of the work.

It may occasionally be found advisable (owing to the nature of the experiment or to the character of the apparatus required) to perform an experiment in the class-room and to omit it from the laboratory course. Such cases must be exceptional, and they must be clearly separated from what is understood to be the work of the pupils. It is suggested that the right hand page of the laboratory book might be used for the pupils' work, and the left hand page for such exceptional exercises as are referred to here, and for theoretical considerations, conclusions, summaries, and so on. All exercises should be dated. Under no circumstances should measurements or calculations, or work of a similar character, be obtained from any source but the pupil's observations—not necessarily unaided, but largely his own. A good teacher will not overlook the opportunities which arise for emphasising the importance of good spelling, grammatical correctness, and careful selection of words, phrases, and sentences; but all these will be subsidiary to the main object—the discipline to be obtained from practice in physical methods.

The use of squared paper, especially for the "curving" of the relation between two varying quantities, is of much importance. Squared paper should not only be used in connection with areas and, say, the verification of certain of Euclid's propositions, but the daily readings of the thermometer and of the barometer should be curved (the relation of the curves to the character of the weather may be brought out), and such observed results as the relation of the circumference to the diameter of a circle; of the area to the square of the diameter; of the volume to the weight of solids of the same substance, but of different dimensions; of the pressure to the volume of a gas, the temperature being constant; of the volume to the temperature, the pressure being constant; of the pressure to the boiling temperature of water; of the length of a pendulum to the square of the time of one vibration, and so on; should all be plotted and the curve drawn, and exercises given to bring out the value of the curve as an important aid to the increase of knowledge.

Not less frequently than the close of each series of lessons, which aims at bringing out a general principle, should the results be summarised and the conclusions indicated. At the same time it should be clearly set out how far the problem in hand has been solved, and how far the results or conclusions are inadequate.

It has not been considered advisable to suggest a third or a fourth year's course at the present moment. Such a syllabus had better come after some experience in the working of the system. It is hoped, however, that the first two years' courses will be found suitable for all pupils as an introduction to Physical or Natural Science; and that, however small the knowledge acquired, the pupil who works thoroughly through this course will gain a notion of the methods and ideas which will meet him at all stages of his further progress in any branch of Science, if not in any occupation in life.

II.—SUGGESTED SYLLABUS.

[NOTE.—In schools taking advantage of these Regulations during the Session 1902, the Department would recommend the First Year's Course for all grades of pupils. Fuller treatment of the subjects would be expected at the more advanced classes. Payments allowed for the Session 1901–2 would in all cases be those for the first year of the course.]

FIRST YEAR.—INTRODUCTORY PHYSICS.

Measurement of Length.—English and metric measures of length: comparison of one system with the other by actual measurements. Measurements of lengths of straight and curved lines. Use of parallel blocks: calipers. Determination of . Use of vernier.

Measurement of Area.—Units of area. Reasons for expression of areas as squares. Direct methods of determining the areas of regular figures. Determination of the area of parallelograms, triangles, polygon, by measurement of linear dimensions. Use of cardboard or other material in the determination of areas. Area of circle, deduced from the relation between the weight of a circle of cardboard and the weight of a square of the same cardboard of side equal to the radius of the circle, and in other ways; indirect methods of determining π, using as figures the circle and the ellipse. Indirect methods of determining areas: use of squared paper: verification of some of the propositions of Euclid, as, *e.g.*, I. 47.

Measurement of Volume.—Units of volume. Reason for expression of volumes as cubes. Direct calculation of the volumes of regular solids from measurements of their linear dimensions. Use of fluid measures: burette, pipette, graduated cylinders, &c. Relation between the volumes of a pyramid and a prism of equal base and altitude: also of a cone and cylinder, proved (1) by measurement of water displaced, (2) by comparison of weights. Indirect measurement of volume.

Measurement of Mass and Density.—By measurements of volume and weight, find the weight of 1 c.c. of various solids and liquids. Weight of 1 c.c. of water. Definition of mass. Definition of absolute density. Definition of relative density or specific gravity. Proof of Archimedes' principle. Determination of the densities of solids heavier than water by weighing in air and in water. Flotation methods of determining density. *Hydrometers.*—Use of Nicholson's hydrometer to determine density. Density of a liquid determined by (1) burette and balance, and (2) specific gravity bottle, (3) weighing a heavy solid in water and in the given liquid. Hare's hydrometer: lactometer.

At this stage should follow some exercises on the "lever" and "pendulum"; the lever, in order that the principles of action of the balance may be understood: the pendulum, in order that the pupils may not only understand the principle of the pendulum as a time-measurer, but also that they may be exercised in time measurements such as are required shortly afterwards in connection with "Heat."

Lever.—Equilibrium of a lever with two or more weights. Principle of moments. Weight of unknown body found by lever, and result tested by balance. Find the weight of the lever itself.

Measurement of Time.—Pendulum: relation between the number of vibrations in a given time and the length of the pendulum. Period of vibration independent of mass of "bob," and—within moderate limits—of the arc of swing.

Barometer.—Determine the weight of one litre of air, under conditions existing in room, by boiling out the air in a flask containing water, &c. Construction of barometer. Effect of introducing air, water, &c., into the barometric column. Reading of barometer. Standard barometer.

Boyle's Law.—Investigation of the relation between the pressure and the volume of a gas. Proof that the product PV is constant at constant temperature. Curve exhibiting the relation P/V. Exercises on curve.

Heat.—Effect of increase of temperature on volume of given mass of solid, liquid, gas—qualitatively. Determine, as far as possible, whether expansion and contraction are regular or irregular. Regularity of expansion a means of determining *hotness* or temperature. The thermometer and its fixed points. Comparison of Centigrade and Fahrenheit thermometers. Conversion exercises unnecessary at this stage. Melting points: boiling points. Relation between boiling temperature and pressure (above and below atmospheric). Co-efficients of expansion. Conductivity and comparison of conductivities from observation of the temperature of melting wax. Newton's law of cooling. Effect of the nature of the surface on the rate of cooling of a body. Rate of absorption of dull and bright surfaces. Quantity of heat. Specific heat. Measurement of the specific heat of metals and of liquids. Put a Centigrade thermometer in a mixture of ice and water over a slow flame, and record the temperature every thirty seconds until the water has boiled for three minutes. Curve. The physical meaning of the horizontal parts of the curve. Effect of dissolving nitre and ammonium nitrate in water. Latent heat.

Should time permit, the course may be extended into Mechanics, or into some *elementary* exercises on Sound or Light, or Magnetism and Electricity.

SECOND YEAR.—INTRODUCTORY CHEMISTRY.

The exact starting-point of the second year's work will depend on the extent of the first year's course. But the second year must be mainly devoted to Chemistry.

Laboratory work should begin with the observation of the apparent differences (form, colour, &c.) of some common and some laboratory substances.

The study of the Bunsen burner, and exercises on evaporation; solution, distillation, crystallization, and filtration would follow. Solubility; solubility as affected by temperature; solubility curves.

Action of Heat on the Metals.—Lead, zinc, copper, tin, magnesium, and iron: observe changes in appearance and weight.

Further Study of the Action of Heat on Iron.—Comparison of iron (bright) with rusted iron, to bring out (qualitatively) the physical differences. Bright iron easily converted into the dull earthy form. Conditions of rusting: in dry air? in moist air? in water free from air? Recall the experiments on density, and find accurately the density of iron and of iron rust. Weigh a quantity of iron filings; rust in enclosed space; weigh again. Increase of weight due to? Test residual air, to bring out the alterations in volume and properties.

Do other metals rust: copper, lead, mercury? Recall previously ascertained results of action of heat on metals.

Try *Phosphorus.* Investigate what happens when phosphorus burns in air: alteration in phosphorus? alteration in air? Compare with "iron" results. Relative volumes of the active and inactive constituents of air. Preparation of the active constituent oxygen from chlorate of potash, and from chlorate of potash and manganese dioxide; properties; oxides.

Action of Heat on Common Laboratory Substances.—Among others on common salt, blue vitriol, nitre, green vitriol, in this last case leading up to production of *Oil of Vitriol.*

Action of Oil of Vitriol on Common Salt and on Nitre.—Preparation of the three common acids. Qualitative study of caustic soda, caustic potash, and ammonia. Salts.

Action of Water and of Acids on Chalk.—Collection of gas evolved; examination of properties; measurement of volume, and weight of acid, obtained from one gram of chalk.

Action of Heat on Chalk.—Collection and examination of gas evolved; identify with that obtained from acid. Observation of the residue; lime, lime water. Lime water (an alkaline substance) and gas from chalk.

Burn carbon in oxygen. Carbonic acid gas and lime water. Identify carbonic acid gas with gas evolved from chalk.

Presence of carbonic acid gas in air. Synthesis of chalk.

Action of acids on *Carbonates.*

Action of Acids on the Metals.—Lead, zinc, copper, tin, magnesium, iron. Prepare, collect, and examine the inflammable gas obtained by treating zinc with dilute sulphuric acid. Burn the gas in air, and identify the product with water. Study of water. Further study of air.

In these exercises much scope will have been found for the use of the balance. For example, in comparing the properties of air, oxygen, and hydrogen, the weight of a litre of each under (*a*) laboratory, and (*b*) (by calculation) N. T. P. conditions should be found. Again, such exercises as finding the volume at N. T. P. (and, by calculation, the weight) of hydrogen displaced from (*a*) dilute sulphuric acid by 1 gram of zinc, (*b*) dilute sulphuric acid by 1 gram of magnesium, (*c*) dilute hydrochloric acid by 1 gram of magnesium, (*d*) strong hydrochloric acid by 1 gram of aluminium; the weight of (*a*) zinc required to displace 1 gram of

hydrogen from dilute hydrochloric acid, (*b*) magnesium, &c., from dilute hydrochloric acid, (*c*) aluminium, &c., from strong hydrochloric acid: and the determination of the weight of oxygen which combines with 1 gram of hydrogen, would lead to much exactness in the use of the balance, and to such fundamental generalizations as the law of constant composition and of equivalents.

No attempt should be made to teach the Atomic theory, to write formulæ, or to give equations for reactions. The course is intended to be an experimental one; but exercises in classification will arise under such headings as elements, compounds, oxides, carbonates, acids, alkalies, and so on.

The pupil will now be in a position to take up the study of one or more of the main branches of Physical or Natural Science; and it is intended that the work of the third year should be devoted to at least one such branch, and that of the fourth to another.

V.—Course in Drawing.

Suggested Syllabus.

[Note.—The present Syllabus is issued merely as a guide to the kind of work that would be expected. Pupils would be allowed to take successive divisions of A in successive years; and a division of B might be taken in parallel with (or, after the first year, in exchange for) a division of A; but the divisions of A and B must be taken in the order given, and payments would not be twice made on the same division in the case of any one pupil.

In the first year of work under these Regulations, pupils who are qualified, may take up the Syllabus at any stage. But the payments will be those for the first year of the course.

The Department intend to issue at an early date an illustrated Syllabus, with suggestions regarding the treatment of the different subjects.]

A.

I. Elementary Freehand Drawing, with the addition of simple exercises in Design. Drawing of Objects in Outline. Memory Drawing.

II. Continuation of Freehand in outline from Casts of Classic Ornament and from good examples of Celtic Ornament. Simple exercises in Design based on natural forms. Model Drawing from geometrical solids—cube, prism, cylinder, cone, pyramid, ring, vase—not more than two models and the board in one group. Object Drawing. Memory Drawing.

III. Drawing in Light and Shade from a Cast; or Modelling; or both.

IV. Design or Modelling; or both.

B.

I. Practical Geometry.—The instruction may be limited to problems involving simple constructions in the following:—

(1.) Constructions required in geometrical pattern drawing, simple tracery, and mouldings.

(2.) Construction of regular polygons—general method. Inscribed and circumscribed circles. Simple cases of rectilinear figures described in or about other rectilinear figures.

(3.) Circles—passing through three points—touching three lines. Tangent lines and circles to one or two circles.

(4.) Construction of irregular polygons from given sides, angles, and diagonals. Similar figures—equal, enlarged, or reduced.

(5.) Plain scales and scale of chords. Proportional division of lines, including the mean, third, and fourth proportionals. Reduction of polygons to triangles of equal area. Construction of parallelogram or square equal to a given triangle or other rectilinear figure.

II. Practical Geometry. Plans, elevations, and vertical or horizontal sections of cubes, prism, pyramid, cone, and sphere in simple positions.

III. Application of I. and II. to common objects and to simple machine or building details. Drawing *from measurements made by the pupils themselves.*

IV. Solid Geometry.

(1.) The Principles of Projection. Definitions of terms in general use, such as ground line, or *xy* line, projector, plan, elevation, section, trace, planes of projection, &c.

(2.) Representation of a point in space, by its plan and elevation, in all possible positions with respect to the planes of projection.

(3.) Representation of vertical and horizontal lines.

(4.) Given the plan and elevation of a line, to determine:—

(*a.*) The traces of the line.

(*b.*) Its true length, and its inclination to each plane of projection. Conversely determine the projections of a line when its inclination to each of the planes of projections is given.

(*c.*) A new elevation of the line on any assigned ground line.

(5.) Determination of the real angle between two lines which meet.

(6.) Representation of parallel lines.

(7.) Simple problems relating to lines.

(8.) Representation of a plane by its traces.

(*a.*) At right angles to one plane of projection, and inclined at any angle to the other.

(*b.*) Perpendicular to both planes of projection.

(*c.*) Parallel to the ground line.

(*d.*) In any position with respect to the planes of projection.

(9.) Given the traces of a plane, to determine its inclination to each of the planes of projection.

(10.) Determination of the intersection of two given planes.

(11.) Determination of the intersection of three given planes.

(12.) Determination of the real angle between the traces of a given plane.

(13.) Determination of the angle between two given planes.

(14.) Determination of the intersection of a line and a plane.

(15.) Determination of the projections and real length of a perpendicular let fall from a given point on a given plane.

(16.) Determination of horizontal lines, and of lines of given inclination, in given planes.

(17.) Simple problems relating to planes.

VI.—Course in Manual Instruction.

I.

A word or two may be necessary with regard to the reasons for encouraging the introduction of Manual Instruction into the curriculum of a Secondary School. The object aimed at here is not technical, but educational; not the knowledge of a craft, nor the acquisition of manual skill (though even the skill acquired will not be without its practical advantages), but intellectual and moral training.

In the trade workshop manual dexterity is the main object, and a young workman acquires skill and rapidity of execution by mechanical repetition of the same or similar exercises. The intellectual interest of the artisan and his pride of workmanship are qualities of the highest importance. The *aim*, however, of his daily work is not so much the stimulation of the one, and the cultivation of the other, as the sale, at market values, of the articles produced.

It is otherwise in a school. The stimulation and maintenance of the pupil's interest in his work are cardinal factors in any educational method or system, and it is claimed that Manual Instruction, more than any other subject of the school curriculum, serves this purpose. In many phases of schoolwork the pupil learns to repeat with precision what he is told or what he reads; he serves to transfer knowledge. His powers to retain and accurately transfer are thus tested. In many, too, his taste and judgment are called in to play. But the productive faculty and the power of initiation have little exercise; and the scope for the pupil's individuality is normally but small. In wood or metal work, manual dexterity is cultivated, and great accuracy in working from dimensioned drawings is demanded. Imagination is called into play: the pupil must form a mental picture of the finished work, for errors cannot be retraced by a scratch of the pen or the use of a sponge. Again, the exercises are lengthy, requiring patience and perseverance; the objects made have artistic qualities which evoke a display of taste; choice of methods, as well as eye-tests, call for exercise of judgment; and, more than all, the pupil sees the work of his own hand and eye grow in concrete form—the active and productive mental attitude replaces the passive and receptive one.

In many respects Drawing and Practical Science make similar claims on the young mind; but the intrinsic value of Manual Training is that in this subject, more than in any other, the pupil realises the

sense of individuality in his work. And this is the more true the less expensive the tools, and the less the machinery.

Again, Manual Instruction must be taken in conjunction with Drawing. Every "joint" must be worked from a previous drawing, made to scale. The realization in concrete form of plans, elevations, and sections gives a pupil an appreciation of solid in relation to plane figures invaluable in Advanced Geometry. Further, it is the experience of most schools, even where Manual Instruction is added to an already full programme of studies, that the efficiency of the ordinary school work is not only not diminished but actually increased.

II.

Drawing is an essential antecedent. The drawings should be made on paper (preferably in a book) and to scale, but not elaborated as drawings. The construction of the plane, chisel, and saw should be explained. In the first year, especially with younger boys, the actual sharpening of the tools should not be insisted on, but the methods of sharpening should be demonstrated. Some knowledge of the qualities of various kinds of wood is useful and necessary.

The work should be individual; under no circumstances would working in pairs be allowed. Correction of errors should not be premature. As far as possible the pupil should first make his own unaided effort. When failure does come, and explanation is necessary, the pupil should fully appreciate why he has failed; and the teacher should aim at securing his spontaneous assent to the suggested or necessary alterations in methods or practice. A room specially fitted up and devoted to the purposes of Manual Instruction is obligatory. Such a room, with places for twenty pupils working at the same time, may be fitted up and equipped for £60 Plans of typical rooms may be had from the Secretary.

NOTE.—The argument for Manual Instruction, so briefly stated above, is but a summary of the case so ably set out in—

(*a.*) The Report of the Commission on Manual and Practical Instruction (Government publication, C.—8923); and

(*b.*) The Report by J. Struthers, Esq., of the Scotch Education Department. (Government publication, C.—7705)

These publications should be studied by all interested in the subject.

III.—SYLLABUS.

First Year.

Setting out, sawing, planing, chiselling, and the working of such exercises or "joints" as the following:—

Planing a square prism.
Planing an octagonal ruler.
Planing a hexagonal ruler.
Step notching.
Angular sawing: tesselated pattern.
Common geometrical forms.
Half-lap joint.
Open mortise and tenon.

Second Year.

Half-lap dovetail.
The bridle joint.
Dovetail.
Mortise and tenon.
Angular halving on edge.
Angular dovetail halving.
"Cogged" or indenting joint.

The work may be varied by occasionally introducing the making of stands, &c., for physical or chemical apparatus. Such small objects as pen-trays, inkstands, frames, and simple brackets may also be made, so long as the character and aims of the instruction are steadily kept in view.

IV.

The following is a list of the tools which will, as a rule, be required for the working of the above exercises:—

LIST OF TOOLS PER BOY.

Jack plane.
Tenon saw.
Try square.
Marking gauge.
Pin hammer (8-oz. handled).
Mallet (square-eye, oval handle).
Screw-driver (5-inch oval handle).
Steel foot-rule (graduated).
Firmer chisels (one each—1-inch, ¾-inch, ½-inch, ¼-inch strong).
Firmer gauges (½-inch, ¼-inch).
Marking awl.
Setting-out knife.
Smoothing plane.
Bench hook.

ADDITIONAL LIST OF TOOLS FOR EACH GROUP OF FOUR BOYS.

Mortise gauge (screw slide).
Sliding bevel (9-inch).
Pair compasses (6-inch winged).
Spokeshave (2½-inch beechwood).
Pair pincers (6-inch).
Pair Pliers.
Set 3 gimlets.
Set 3 bradawls.
Pair winding strips (1 inch by 1½ inches by ½ inch).
Straight edge (2 feet by 2 inches by ½ inch).
2 Mortise chisels.

OTHER TOOLS NECESSARY FOR EACH WORKSHOP.

2 Trying planes (17 inches).
1 Bow saw (10 inches).
1 Brace and set of bits.
3 Handsaws (22 inches).
4 Oil stones in cases.
4 Oil cans.
2 12-inch try squares.
A grindstone.
1 Glue-pot.
4 Brushes for bench.

The Department has had drawings of typical laboratories and Manual Instruction rooms prepared, and will supply them to Managers of Schools who make application to the Secretary.

(3.)

MEMORANDUM on AGRICULTURAL EDUCATION for IRELAND,

By the Right Hon. HORACE PLUNKETT, P.C., Vice-President of the Department of Agriculture and Technical Instruction for Ireland.

(See the evidence of Mr. T. P. Gill, q. 4008.)

NOTE.—The following Memorandum defines the lines on which the Department of Agriculture and Technical Instruction are prepared to promote a system of Agricultural Education for Ireland. It has been considered and approved by the Agricultural Board.

TO THE IRISH FARMER AND HIS FRIENDS.

Why cannot Ireland, depending chiefly upon agriculture, have a system of Agricultural Education at least equal to that which the farmers of any other country enjoy?—While my colleagues and myself have been busily engaged setting the new Department, with its varied functions, to its work, this question has been constantly before our minds, and the sense of its importance has daily increased. The more we examine into the conditions with which we have to deal in our task of rendering the highest service which a central administrative body of the kind can render to our country, the more conscious we become of the fact that education, in its broadest sense, is the chief agency of progress which we can employ. As regards urban

and manufacturing districts this principle is generally accepted. It is equally true in its bearings upon rural life, although its application to the conditions and needs of the farming community—the application with which this memorandum is specially concerned—is less obvious and more difficult to define.

We have now succeeded in agreeing upon a policy, and in formulating what we hope will be found to be a sufficiently definite and comprehensive scheme for the attainment of the end in view. It will be seen that our scheme, being a graft on the educational tree rather than a separate growth, will need the active co-operation of educational and administrative bodies other than ourselves. Above all, it will require the support of the great mass of the farming community, who will, we are confident, in this matter sustain the historic reputation of the Irish people as lovers of education. While, therefore, this explanation of the Department's scheme is primarily an official pronouncement addressed to County Councils and others who are expected to take action upon it, I propose to treat the whole subject from the point of view of those chiefly concerned, and I hope that our conclusions, and the reasoning upon which they are based, will commend themselves to the intelligence of the practical farmers of Ireland.

FUNDAMENTAL PROPOSITIONS.

Before we can apply our minds earnestly to this question, there are two propositions which I must ask you to accept without argument. The first is that Irish farming does admit of an improvement which, if effected, would involve a vast addition to the nation's wealth, would greatly enhance the comfort and well-being of the people, and would tend in some measure to check the deplorable drain of emigration. I shall also ask you to admit that, whatever other causes may account for the backwardness of our agricultural methods, even if all these causes were removed, a thoroughly sound and modern system of agricultural education must precede any considerable or rapid progress towards a high state of efficiency in this our chief industry. If we are thus far agreed—and I am sure we shall be—I may proceed, without further delay, to submit what I believe to be the principles upon which such a system may be provided for Ireland. And let me ask you to bear in mind that existing farmers as well as the rising generation have to be included in a general scheme, not only because, owing to the now constant application of science to agriculture, it is difficult for the working farmer unaided to keep himself abreast of every new development, but also, because we need the hearty co-operation of the fathers of the young men and the young women whom we desire to start out upon a career of home industry with the educational advantages enjoyed by the most progressive agricultural communities abroad.

NECESSITY FOR SOUND PRINCIPLES FROM THE OUTSET.

In outlining a policy on such a vastly important subject, the Department has to consider not only what is theoretically best, but also what is practicable, having regard to the machinery through which it must work, and the funds at its disposal. As you will see, we do not propose any large capital expenditure at this stage. Some capital sums now, a good deal later on, may have to be sunk in land, buildings, and equipment for the purposes of agricultural teaching. But I cannot exaggerate the importance of extreme caution in embarking upon this outlay until we are sure that its utility will be permanent. It would be worse than a waste of money and energy to inaugurate elaborate schemes, which might be found, on experience of their working, to have been premature or unsound, and which might have to be dropped or entirely remodelled. I would impress upon you that any waste of the resources of to-day by unwise expenditure is a trifling consideration compared with the mortgage we should be placing upon the industrial capacities of future generations of our countrymen were we now, at this crisis in the economic life of the nation, to start out upon wrong educational lines.

THE CLASSES WE WANT TO REACH.

One test which we shall all apply to any system that is proposed for the teaching of agriculture will be the number of persons actually engaged in the calling of agriculture who will be brought within reach of the educational facilities afforded. There are in Ireland over half a million farmers and labourers with the usual proportion of sons and daughters. These cannot all be educated at once; but they are all part owners of the Department's funds, and we must try to give them all, so far as possible, an opportunity of deriving direct or indirect benefit from the Department's schemes. Information and advice to the adult, practical education to the young, must be as widely diffused as is possible with the funds and the machinery under our control.

I will first discuss the problem of agricultural education in the usually accepted sense of the term as applying to the training of young men and young women who are of the farming classes. A good deal of misconception exists as to what exactly is the problem we have to solve. If it were simply a question of the purchase of so many acres, the erection and equipment of buildings, the engagement of staffs of professors and assistants, I would have published a scheme long ago which would have worked splendidly—on paper. But here are the real questions we have to answer. Where shall we get the pupils we want to teach? For what career shall we seek to fit them? At what age shall we take them? How long a course shall we give them? What previous education must they have had? What fees can they afford to pay? If we want Agricultural Colleges of the type with which we are familiar in England, I daresay we could have first-rate institutions of the kind. Through them we might not only give what is usually considered a good agricultural education to selected Irishmen, but we might even attract students from England and Scotland as well. We might turn out land agents, surveyors, land stewards, gentlemen farmers, colonists, and such like by the score—perhaps, even an occasional Vice-President! But, while institutions of this kind will, no doubt, find a place in our completed system, what I am sure we shall most of us agree should be the chief object of the Department is to provide an education for young men who intend to follow the calling of farmers where they are born and bred. We must induce their fathers to send them from the farms, and induce them to go back to the farms and take their part in building up from its very foundations the industry upon which by universal agreement the welfare of Ireland must, so far as we can see into the future, ever mainly depend. There is our practical problem—to make Irish farming more profitable, and—I attach immense importance to this—more interesting to those actually engaged in it. The more you think of it the more you will be convinced that it is primarily and chiefly a question of education. But the education must be applied with a thorough knowledge of the conditions of the country, with a discerning sympathy with the sentiments which prevail in the agricultural community, and in a well-considered relation to those existing educational systems which, as you are aware, are undergoing modifications of the greatest importance to the work we have in hand.

THE CHIEF DIFFICULTIES TO BE SURMOUNTED.

We now come face to face with the real difficulties which have to be overcome.—All educational reform is confronted with this adverse condition, that the supply has to precede the demand. A full understanding of the value of education, and consequently a desire for it, is only given to those who have enjoyed its advantages. We have already had the most gratifying proof that among the Irish farming classes are to be found far more than the usual proportion of local leaders who are enthusiastic advocates of agricultural education. Nevertheless the difficulty I have referred to exists in rural communities in Ireland as it does elsewhere. And there is another factor to be taken into account. The difficulty of getting hired labour is increasing year by year, and farmers simply cannot afford to send their sons to any school or college which is either likely to make them discontented with the opportunities of their home life, or to deprive the farm of their labour, even for a year or two, during the working months.

Let us, however, for the moment dismiss from our minds the difficulty of getting pupils and teachers, and apply ourselves to the question—how and where are pupils to be taught? The further questions, what they are to be taught and from what source the new supply of teachers is to be drawn, I will deal with when I come to explain more fully the Department's system.

THE RELATIONS BETWEEN AGRICULTURAL EDUCATION AND THE EDUCATIONAL SYSTEMS OF THE COUNTRY.

I must here state another general proposition about education, to which too much importance cannot be attached. All the educational systems of a country, all its educational institutions are, or at least ought to be,

interdependent. Whatever is done in the way of practical education, regard must be had to the existing educational systems, Primary, Secondary, and Higher. I press this proposition upon my readers because, when in conversation, I have outlined our scheme to some whose opinion I value, I have noticed a sense of disappointment that the Department is not prepared to introduce with a few bold strokes some startling new developments with an embodiment in bricks and mortar which all the world can see and admire. This mode of proceeding has been sufficiently tried both in agricultural and industrial education, and has given way to the wiser policy of treating the education of a country as an organic portion of the country's life, discharging its varied functions in a well-considered relation with each other. We must profit by the teaching of other countries who have purchased experience in this matter—and purchased it often rather dearly—and recognise that when our system of agricultural education is established, it cannot stand alone. Any school in which agriculture is specially taught will depend for its utility—if not for its pupils—quite as much upon other schools as upon itself.

Our educational systems have made no preparation for such institutions as those which most of us thought the new Department would hasten to establish. They are doing so, however. The Commissioners of National Education, as you are aware, are at present endeavouring to reform their entire system; they are introducing into all the National Schools a new programme, the principal aim of which is to render the instruction in these schools more practical, and to give it a more direct relation to the business in life for which the majority of the pupils are intended. Thus, in the Primary Schools, the attempt is now being made to fit the pupils for receiving the benefits of the further stages of practical education, whether their careers be agricultural or industrial. At the same time our own Department has this year taken over the administration of the grant commonly known as the Science and Art Grant, which has hitherto been administered by the Board of Education, South Kensington; and we, in our turn have issued a new Programme of Experimental Science, Drawing, Domestic Economy, and Manual Instruction, which will enable all the existing Secondary Schools in Ireland to prepare in their degree pupils for the further stages of practical education. Furthermore, this new Programme of our Department has now been adopted as part of their general programme by the Commissioners of Intermediate Education, so that from this year also every Intermediate and Secondary School in Ireland will be aided by the grants from our Department and from the Intermediate Education Board to introduce the system of Practical Science teaching which is not only an important part of general education, but which is absolutely necessary to pupils who desire to pass on to the more advanced, or more technical, stages of agricultural education. It is our hope that, while nearly all of these schools will take up this new curriculum in the interests of the study of Science generally in Ireland, some of them—and, perhaps, others yet to come—where natural conditions and facilities point that way, will so adapt themselves as to make special provision for practical agricultural courses for pupils coming from rural districts. The work which at this moment our Department and the other educational authorities are engaged in doing in such schools is absolutely essential for the development of any system of agricultural and industrial education, and the County Councils throughout the country cannot better prepare the way for their own and the Department's joint educational work than by helping them in every possible way to introduce this great reform.*

POSTPONEMENT OF INSTITUTION BUILDING.

I have, in the foregoing, stated the case for the utilisation of existing agencies—the development of that which we have, rather than the more showy expedient of brand new institutions. I think this course will approve itself to the mature judgment of the country. Nothing would be easier than to copy some of the admirable schemes for agricultural education which Continental countries have made so successful, and to present a plausible appearance of adaptation to our own conditions. While the Recess Committee found almost everywhere abroad some lessons most applicable to the problem we are discussing, they were, quite early in their investigations, made alive to the danger of mere servile imitations. These Continental models are most alluring, because they are both efficient and economical. Many of them seem so exactly to deal with the conditions of Ireland that their transplantation looks as easy as putting up a Swiss chalet on a Wicklow mountain. But what does not appear on the face of these schemes is the history of their growth and the educational atmosphere with which they are surrounded. If you will give us all the help we ask, we hope, in a not distant future, to make no poor show alongside of the best of them. Meanwhile let us avoid the illusory attempt to reap where we have not sown.

POSTPONEMENT OF PROVINCIAL AGRICULTURAL COLLEGES.

The provision in our Act of £10,000 to be applied in connection with the Munster Institution was generally taken to foreshadow the early erection of a Provincial Agricultural College, and the Department was influentially approached, as soon as it was created, with a view to the establishment of similar institutions for the provinces of Ulster and Connaught. I may say at once that any province which could solve its educational problem in this way would find the Department most anxious to provide its full share of the funds required. It is only human nature that the Vice-President should desire to erect such monuments to his educational zeal during his term of office. Indeed, I may confess that I was grievously disappointed when certain castles in the air vanished before the knowledge which, owing to the pressure of miscellaneous duties, it took me a year to obtain. But, unhappily, we cannot honestly recommend the country to begin at this end, because our system of agricultural education in Ireland, which we are only about to construct, will not for some years yet be ripe for provincial collegiate institutions of this type. They might do some good, but it is clear that they would not meet the needs of the half million farmers of Ireland, and would not ensure the support of the County Councils. They might even do positive harm by retarding what you will see presently is one of the primary objects of the Department—the creation of a belief in and a desire for practical education in the minds of the working farmers of Ireland. In England and in Scotland, the County Councils have had the same problem to deal with. There they have had the start of us in education, and their conditions are much more favourable to the provincial college type of institution. They have tried this type in many places for the past ten years, and so far as the purpose of meeting the direct needs of the working farmer is concerned, the system has been a failure. Such colleges turn out agricultural professors, it is true, but they do not turn out farmers, and the farmers do not resort to them. They are now beginning to change the system, and after ten years of the work of the itinerant instructor (to be presently explained) several of them have an agricultural population better fitted for the benefits of these institutions. Let us not repeat the mistakes of the English and Scottish County Councils, but take advantage of the experience they have purchased at much expense.

THE DEPARTMENT'S SCHEME OF AGRICULTURAL EDUCATION.

I have now endeavoured to come to an agreement with you as to the objects to be aimed at, and as to the general principles to be observed in seeking their attainment. It has been necessary to devote a good deal of space to the discussion of what we ought to avoid. The ground had thus to be cleared for the presentation of the scheme which the Department submits as the best under existing circumstances, and which, so far as its local features are concerned it will do its utmost to put into practical operation at the earliest possible moment in any county where the co-operation of the County Council is assured.

*Perhaps I ought to make it clear here, when referring to primary and secondary schools, and to the Department's administratio of the Science and Art Grant that we by no means look upon the education of the country as if it ought altogether be turned in the direction of technical instruction, whether in relation to agriculture or urban industries. We take a broader view of education than that; and, moreover, the Department has an educational function beyond that given to it in its special capacity of organiser of a system of technical instruction. As the Administrator for Ireland of the Grant of Science and Art, a duty which was hitherto discharged from South Kensington, it is bound to have regard to the interests of general education. It is on that footing, and with that end in view that we enter, with the Intermediate Education Board, th general secondary schools of the country. We are speaking here, however, specially of agricultural education and of such of the existing and future schools of this country as can naturally lend themselves to this particular purpose, while at the same time serving the purposes of general education—schools so aptly located, dealing already with so large a proportion of rural pupils, that to give them a special agricultural side would assist them in their true function as regards these pupils that of making educated farmers.

DOCUMENTS, II.

Our scheme at the outset is threefold in its operation. It consists of itinerant instruction, of the utilisation of existing schools, and of the training of teachers. But at a further stage, which will be reached at an earlier or a later date, according to local conditions, but which should not be prematurely forced, Technical Schools to serve a county or smaller area, either exclusively or partially for the special teaching of agriculture, will be required. These may, and, we hope, will, lead up to higher agricultural institutions aided by groups of counties, the provincial line being observed if there be any strong sentiment or practical convenience to be served thereby. But first let me explain as clearly as I can the different steps in the procedure I have outlined, beginning with the system of itinerant instruction upon the successful operation of which the working out of our scheme will largely depend.

ITINERANT INSTRUCTION.

We hope, eventually, to see established as part of the educational machinery of every county in Ireland an Itinerant Agricultural Instructor, whose services shall be given exclusively and permanently to the particular county to the Council of which he is attached. If there is one feature of agricultural education which, having been tested to the utmost in every country of the world, has stood that test better than any other, it is the itinerant instructor. In our researches at the time of the Recess Committee this was a feature which in every country the administrator and the educationist laid stress upon, as showing invariably most fruitful results; and all the experience of the Department since has confirmed us in the faith which the experience both of England, Scotland, the Continent, Canada, and America, had implanted in our minds.*

Now what are the functions, the work and the qualifications of the itinerant instructor? His principal function, in a word, is to be the guide, philosopher and friend of the existing farmers. While, no doubt, a good many of the younger generation, even of the boys of school-going age, will derive benefit from the teaching of the itinerant instructor, and while he will render an important service in supervising the practical course of agriculture in the schools in the county, to be referred to later on, still his main concern is with the actual working farmers. For them it would be unnecessary to attempt a scheme of systematic instruction in the principles of agriculture. Comparatively few farmers wish to know by what mode of reasoning the scientific expert arrives at the conclusion that while one class of soil would be benefited by an application of lime, a second should have a dressing of basic slag, and a third a mixture of basic slag and kainit. Similarly with regard to every branch of agriculture, be it crop raising or milk production, the average farmer wants to know the most profitable practice to follow under a given set of conditions. Tell him this and he will readily dispense with the scientific reasons on which the advice is based. But for all that much can be done, even in this process, to increase the number of thinkers among the farming classes. Exactly what effect we may produce time and the working out of the entire scheme alone can show. But we should aim at making every farmer an observer, an experimenter, and so a possible contributor to the progress of Agricultural Science. Of course, we all know that the chief means to this end is, by supplying the youth of the country with such a training as will give them the power of working out agricultural problems on a scientific basis. But by bringing home to the existing farmers what is the practical outcome of that which has already been accomplished by the application of science to agriculture, a good beginning can be made. Some people believe that this can be accomplished by means of the agricultural press and by leaflets. We hold strongly that printed information cannot possibly be made as efficient as the living agent.

QUALIFICATIONS OF THE ITINERANT INSTRUCTOR.

The itinerant instructor must be a man who has had a first class training in science—such a training as will enable him to rely on his own judgment in deciding what should, and what should not, be recommended. But a first class training in science is not enough. If possible, he should have been born to farming, and should have been steeped in it from his boyhood. Only then can he properly estimate the difficulties with which the farmer has to contend. Incalculable harm has been done to the cause of agricultural education by purely scientific men who too often are accustomed to speak lightly of the farmers' difficulties. In doing so they display great ignorance. Accustomed to work under the constant conditions that can be maintained in the laboratory they would have the farmer to cultivate his land and feed his animals in accordance with formulæ deduced from laboratory experiments. They overlook the fact that farmers have to contend with a number of varying factors of a meteorological, biological or economic nature. Some of these scientific gentlemen have themselves tried farming according to formulæ, with the result that they have learned to place a higher estimate on the intelligence of the farmer, and the farmer a lower estimate upon the value of scientific training. The Department will set its face against such teachers of agriculture, and more particularly against itinerant instructors in agriculture who are mere scientists, no matter how distinguished they may be.

Before dismissing the question of the qualifications of the itinerant instructor, it is desirable to add that these instructors should be familiar with, and able to accommodate themselves to, the manners and customs and the sentiments of the people. I admit that a sufficient supply of such men will for some time be hard to get. Plenty of them have been born, but few made. We are making some, and the Department will, as I shall presently explain, lose no time in taking the necessary steps to meet the demand for these functionaries, which is already growing apace. But it must be remembered that the training of a functionary of this special and important type is not the work of a day, and that it will be wiser to wait for a thoroughly trained and competent man than to appoint a man imperfectly qualified to discharge such very responsible duties.

WORK OF THE ITINERANT INSTRUCTOR.

I will now give a rough sketch of the work and functions of the itinerant instructor. It is during the winter months that farmers have most leisure to attend meetings; the work of the itinerant instructor should therefore begin early in October, and should at that stage take the form of lectures on subjects chosen to suit the class of farming in the respective districts. The county should be divided into districts, which might, or might not, correspond with the Rural Districts, and the lecturer's time so arranged that he would get over the whole county by an early date in March. Let us suppose that a county has five districts; that the lecturer remains four weeks in each, and that he delivers five lectures per week. Let us further suppose that five centres are selected in each district, named A, B, C, D, and E, respectively. At A, the instructor would lecture on four consecutive Monday evenings; at B, on four consecutive Tuesday evenings; at C, on four consecutive Wednesday evenings; and so on. A week would then elapse between two lectures at any centre, which would give the farmer ample time to think over the preceding lecture, and make a note of questions to be asked at the next meeting.

Having spent four weeks in one district, the instructor would pass on to the second district, and having spent four weeks there, would pass on to the others in turn. In twenty weeks he would have got round the five districts, and would have delivered 100 lectures. At each centre, in a circuit or district, a local committee would be formed, composed of County Councillors, Rural District Councillors, or other persons selected owing to their interest in the work. The duty of the committee would be to advertise the lectures by means of posters, leaflets or advertisements in the local papers, and arrange for a chairman at each meeting and for the heating and lighting of the room, which would usually be in the National School.

The business of the itinerant instructor would be to treat the subject of each lecture in a practical manner, stating what definite facts are known with regard to it, and to reply to questions, which should be freely invited at the close of each address. It has been found, in Ireland and elsewhere, that the discussion and questions at the close of each lecture are even more valuable, and take up more time, than the lecture itself. The importance of this cannot be over-estimated, as it gives farmers an opportunity of stating their ex-

* Curiously enough, the Commissioners of National Education tried the experiment half a century ago. It was abandoned as unwarrantable State interference with industry in the hey-day of the Manchester School.

periences, which is profitable, not only to the rest of the audience, but also to the instructor himself, who in turn carries from parish to parish valuable practical information.

In addition to the lectures in the evening the instructor should, during the day, visit the farms in the neighbourhood, when invited to do so, and inspect the lands, buildings, and stock, in order that, knowing the conditions under which farming is carried on, he may be able to frame his information to suit the requirements of the district. As it would be an important part of his work in spring and summer to conduct field experiments with manures and seeds, the fields on which these tests are to be made should be chosen during the time he is stationed in the district so as to save valuable time in spring, when he would be busy attending to these experiments on the demonstration plots.

During summer, field demonstrations should be arranged for the purpose of showing the influence of the manures used in the experiments, and the good or bad qualities of any new variety of potato, grain, or other crop which may have been put under test. In autumn he would have to see these crops harvested, and prepare leaflets giving the results of the trials, which should also form the subject of further lectures.

But the work of the itinerant instructor would not end in a district where he had given his lectures and conducted an experiment. The number of questions on practical subjects which continue to arrive at the Department, show quite clearly that there is a growing demand for information on specific subjects, and the demand always increases in districts where the itinerant instructor has been at work stimulating thought and action among farmers. It would be the duty of the instructor to be always ready to answer questions addressed to him by letter from farmers in any part of the county. Such questions, for example, as the best mixture of manure for different crops and soils—the best mixtures of grasses for any special purpose—the best and cheapest form of feeding stuffs for milk production or for calf feeding, or for kindred purposes—the money value of artificial manures—where new varieties of seed potatoes are to be obtained—the name of a grass—the name of a weed, and what is known concerning the best method of eradicating it—how the smaller farmer may take advantage of the Department's live stock schemes, or of any other which may be issued—and a host of similar questions too numerous to mention.

In addition to all this it would be his duty to keep constantly under his eye the practical agricultural course given in such schools in the county as included such a course in their curriculum.

An itinerant instructor who can gain the confidence of the people, and who, by showing a readiness to assist them in procuring the most recent information on every subject connected with their business, can become a power for great good in a county—this is the class of instructor that the Department wish to see.

OTHER FORMS OF ITINERANT INSTRUCTION.

I have spoken hitherto of only one type of the itinerant instructor—the Instructor in Agriculture—because this is the main, the permanent type, whose work we hope to see established as part of the regular administrative life of every county. But there will be other instructors for special subjects and industries. Already in a few counties we have itinerant instructors in poultry keeping, whose business it is to teach, especially the women—the wives and daughters of the farmers and labourers—how to rear poultry on the most efficient lines. Similarly we hope there will be dairy instructresses and teachers of bee-keeping, cottage gardening, fruit growing, and every similar industry by means of which the labourer and small farmer can be shown how to make the most of his holding. We hope, moreover, to have itinerant instruction in cookery and domestic economy, provided for districts in which the school facilities do not suffice for the teaching of these subjects to the girls of the agricultural classes. To these matters I will refer again further on.

THE TEACHING OF AGRICULTURE AT SCHOOLS.

I hope some counties will demonstrate in the near future that I have not exaggerated the assistance we may give to and get from the existing farmers in setting our new educational system to work through the scheme of itinerant instruction carried out in the manner I have detailed. This is, however, only one means towards the educational development we have in our minds. We are quite aware that we shall only begin to discover the possibilities of farming when science is properly applied to it, and this can only be when we have, among the farmers themselves, a body of men trained from school days to observe and interpret accurately the influence of environment on plant and animal life. It is to the younger generation we must look for this class, and it will not be long before the advance guard of them comes to our assistance. For this reason we must have, as soon as possible, a graduated system of education, of which practical science will form an important part.

I say "practical" science because I desire to emphasise the purpose that scientific training will serve in our Secondary Schools. It is now recognised that mere information in regard to the facts of science constitutes only a part—and a small part—of the function that science should exercise in an education intended to fit a youth for the business of life. The instruction must be directed to the cultivation of a habit of thought, to the scientific method, and to secure this it becomes necessary that the student should not merely be told, but that he should find out these facts for himself—as far as may be—under careful and enlightened direction. As much depends upon the manner in which he has acquired this knowledge as upon the actual possession of it.

In primary education, as you are aware, we have no direct function. But we must rely upon the Commissioners of National Education to give us a good foundation to build upon, as they must rely upon us to see to the stability of the superstructure. They know what we want. We do not want children in the primary school to be taught practical farming. School farms are based on a wholly wrong conception of the training of the young mind at the age when the greatest effect is produced in the moulding of the faculties. Some educationists equally condemn school gardens, though I should say they might at least be made healthful, pleasurable, and elevating adjuncts to the playground. What we do want, and what the National Education Commissioners are now preparing to provide, is, that the children should be given elementary notions of science, and a training of the faculty of observation through illustrations of scientific teaching drawn from the physical surroundings of rural life—a course which has come to be called "Nature knowledge."

AN EDUCATIONAL GAP.

At the present time, when a boy in any Irish rural district has completed his career at the National School, say, at the age of thirteen, usually his education stops. This is the most serious gap in our educational system. The years from thirteen to, say, seventeen, are the formative years, the most valuable years for the purpose of education, and these years, to the vast majority of Irish country lads, are educationally lost. In many districts the boy is put to work about the farm at thirteen, or even earlier; in other districts he may not take his part in the regular labour of the farm till he is fourteen or fifteen; but everywhere his education ceases once he has left the National School, and everywhere the country boy at this period of his life practically runs loose during the winter months. The effect of this experience generally is, that at the age of seventeen he has forgotten the best of anything he learned at school. He is thus, moreover, quite unfitted to receive the class or grade of agricultural education which in a developed system would be available for young men of that age. Now this, I need not say, is no way to bring out the intelligence of the Irish farming class. It is, indeed, the most effective way that could be conceived of stultifying that intelligence. I think the best work we shall do with our scheme of agricultural education in rural districts will be to fill up this disastrous educational gap.

We propose to arrange so that the education of the country child need not stop when he has passed the sixth class of the primary school, but may be continued. We propose to open the door of the secondary school, or the secondary stage of education, to him, and to adapt the teaching in the secondary grade so as directly to advance him in the practical training necessary for his career in life. If the primary school does its part, the boy who completes his course therein will be qualified to enter a secondary school; and if the secondary schools—existing schools situated in

country towns, or in or near rural districts, or new secondary schools, which may hereafter be started, or National Schools which may in certain rural centres find it possible to add on to their primary work a secondary and practical side—if such schools do their part, they will be in a position, to begin with, to give the boy two years, or two winter courses of essential training in practical science, together with a training in the keeping of farm accounts and the conducting of business correspondence, and to continue at the same time his general education. At the end of these two years, or, perhaps, in some cases, during these years, the boy will be fit for a special course of practical or technical agriculture. This course should last for two winter sessions of about five months each—the winter sessions being selected so as not to take the boy from the work of the farm during the busy months of the year—and should, if possible, be given at one of the secondary, or one of the developed primary schools above referred to. The course, wherever given, would be under the constant supervision of the county itinerant instructor and of the inspectors of the Department. Now all along that road, from the primary school onward, the way of the rural boy must be facilitated. We propose that the secondary school, which will be aided by our grants and those of the County Councils, shall give its teaching, so far as may be possible, at such fees as will be within the reach of the poorest. And we propose that for every rural district, by means of grants from the County Council, aided by grants from the Department, a certain number of scholarships or "bursaries" shall be provided, which will enable boys leaving the primary schools to obtain their training in the secondary schools free; and we propose that this system of aid by bursaries and scholarships shall be continued through every educational grade, so that after the secondary grade the more brilliant or exceptional boys who had shown a special aptitude for the advanced study of agricultural science might pass on from the secondary school to the agricultural college, and so on up to the reorganised Royal College of Science and the university. Thus, I hope we shall be able fairly to boast, when our work is sufficiently developed, that we have opened an avenue by which the son of the poorest farmer or labourer who has sufficient native talent, may advance, free of cost to his father, from the rural primary school right up to the highest institutions in which will be trained the future Irish savants and professors whose duty it will be to carry on and develop the work of applying science to our agricultural problems.

A word must here be said in regard to the education of girls. For girls we hope to establish a similar link, as in the case of boys, between the primary and the secondary school; and in the girls' secondary schools special emphasis will be given to the teaching of domestic science. This needs no justification. Whatever her future in life may be, a girl will in all probability sooner or later be concerned with the care and well-being of others, and a training in household management (including cookery, &c.) the principles governing the maintenance of health (including sick-nursing) and the care of the young, must be regarded as an important part of a girl's educational equipment. As those girls for whom this scheme makes special provision will belong to the agricultural classes, this teaching should include also, dairying, poultry management, and care of farming stock, &c. In many districts instruction of this kind must be taken to the very doors of our people, and just as in the matter of agricultural education, so in regard to what, for the want of a better term, we may call household economy, we hope by means of well-trained itinerant instructresses to carry this means of training into even remote rural districts.

THE HIGHER INSTITUTIONS AND THE TRAINING OF TEACHERS.

The Department do not disguise from themselves the difficulty which confronts the launching of such a scheme as I am describing, owing to the dearth of qualified teachers for the new work. But for the earlier stages of the work in the schools—for that Programme in Experimental Science, Drawing, Manual Instruction, and Domestic Economy already referred to—much can be done by a series of special courses, given to existing science and art teachers, which the Department have organised in centres at Dublin, Cork, and Belfast. The training of teachers for special agricultural instruction will be slower work. For the training of these, however, the Department have at hand certain educational agencies which, happily, they can adapt to their purpose.

The Department have taken over, as you are aware, the existing institutions known as the Albert Model Farm, Glasnevin, and the Munster Dairy School and Agricultural Institute at Cork. Although, for reasons I have fully set out above, we do not intend at present to multiply such institutions, we mean to make the utmost use of those which we already have. We shall immediately take steps to organise the work both at Glasnevin and at Cork, so as to make them serve the objects of the Department's general education programme. As that programme demands instruction both for young men and young women, and as the present system of having alternate classes of men and women at each institution is attended with considerable loss of efficiency, the Department have resolved to reorganise and extend the existing Munster Dairy School as a higher class school of farm and domestic economy for girls only. On the domestic side, the pupils will be taught laundry work, cooking, needlework, &c., while on the farm side the Department hope to equip the school for the highest form of dairy instruction, coupled with such other branches of instruction as are required to fit young women either to become farmers' wives, dairymaids, or instructresses in these subjects. Fortunately, the past history of the Munster Dairy School shows that it has a distinct sphere of utility in the technical training of girls. What is obviously required is that this branch of its work should be encouraged, and the Department will spare no effort in making the institution one of the best of its kind in any country.

The question of the provision for male agricultural pupils in connection with the Munster Institute, as distinct from the existing Dairy School, is one which the nature of the case suggests should be specially considered, in the first instance, from the point of view of so important a county as Cork. Whether that provision should take the form of a technical agricultural school of the secondary grade already described, which might grow eventually into a provincial college, or whether the County Council will prefer to delay their help towards meeting local educational needs in the less ambitious directions until the situation is ripe for a collegiate institution, practical circumstances will determine, and, I am confident, will determine satisfactorily. What is manifest is that, for such a demand for the higher grades of agricultural teaching as at present exists in Ireland, or as is likely to exist for the next two or three years, there is ample provision now at the disposal of the Department in other institutions, the more important of which the Imperial Exchequer will fully maintain without our having to draw either on the Department's special endowment, or on the rates of the County Councils. The institutions to which I refer are the Albert Model Farm, Glasnevin, and the Royal College of Science. Until it becomes clear that these institutions are insufficient to meet the increasing needs for higher agricultural teaching for male students, the Department cannot recommend any province to devote its resources to providing locally for this grade of technical instruction.

The Glasnevin Institution, then, in its turn, will cease to take in female pupils, and will be reorganised and altered, so as to fit it still more completely for the training of young men who intend to follow the higher branches of farming, or to become instructors in technical agriculture. In the past there has been a fair demand for instruction of this kind at this Institution, but the demand for places has not equalled the capacity of the school. Now that it is to be made an institution entirely to be devoted to young men, it is expected that for some time to come it will far more than suffice to meet the normal demand, as well as the special demand, created by the introduction of the programme of the Department. I may add that courses for young men desiring to become creamery managers will be continued there. I will not enter here into the details of the character of the instruction to be imparted, or of the changes and additions that are about to be made at this institution. It is sufficient for me to state that no effort will be spared to make its equipment of the best.

It is not, however, proposed that the young men who attend the Glasnevin Institution should be provided there with a training in the very highest forms of agricultural science, or with facilities for agricultural research. For this purpose there is available a still higher institution, which is now also under the control

of the Department, viz., the Royal College of Science in Dublin, which is about to be thoroughly reorganised so as to take its place as the principal Technical College for Ireland, in the educational programme of the Department. That programme, indeed, would be incomplete if it did not provide Ireland with at least one institution for the very highest form of teaching and research in science applied to Industries and Agriculture, and the Department are fortunate in having such an institution to their hand. Among other developments which it is intended shall take place at this institution is the provision of a Chair in Agriculture, which will be one of the most important faculties. Unlike the other institutions, which must be maintained out of the Department's own endowment and local rates, the Royal College of Science is to be rebuilt, staffed, and specially equipped, as well as maintained, out of funds furnished by the Imperial Treasury. As the Department are fully alive to the necessity for providing the highest form of scientific research, they hope to make this institution under its new form rank among the best in Europe.

The highest form of agricutural instruction and agricultural research can only be carried out efficiently where land and farm buildings are available. It is proposed, therefore, that there should be a close connection between the Agricultural Faculty of the Royal College of Science and the Model Farm at Glasnevin, where, in addition to the provision for the training of technical agriculture, with which I have already dealt, a special provision will be made for attacking those problems which the staff of itinerant instructors show require solution for the benefit of Irish agriculture.

Anticipating the reorganisation of the Glasnevin Institute, and of the Royal College of Science, as well as the demand for itinerant instructors, the Department, as far back as last October, provided facilities for laying the foundation for intending instructors of agriculture. They then entered for the first session of a complete three years' course six farmers' sons. A further batch will be put in training this year, and this process will be continued until the demand has been fully met. We are also considering the provision of a limited number of travelling scholarships for young men whose capacity as teachers seems likely to be increased thereby.

There is already an urgent demand from some counties where this part of the system is already understood, for itinerant instructors, and many other counties will soon be on the look-out. In the hope that a certain number of young men might be found who had already had a sufficient amount of scientific training and practical experience to require a comparatively short further training to fit them for this work, the Department made provision for special courses of instruction in agricultural subjects to be given in Dublin this summer, and they invited such young men as had the necessary qualifications to make application to attend these courses, in order to equip themselves, if possible, for entering upon the work of itinerant instructors next October, by which time we may be in a position to meet a moderate demand. Such a plan as this is, I need not say, a mere expedient for supplying the more pressing needs of the moment.

RURAL INDUSTRIES.

There is one factor which should be kept in view in considering a system of agricultural education for Ireland, and that is the development of rural industries. I have refrained hitherto from referring to rural industries in this memorandum, for fear of overloading a scheme which is mainly educational. At the last meeting of the Council of Agriculture, however, an interesting discussion took place which convinced us that our scheme would not be hampered or misunderstood, but, on the contrary, would be rendered far more acceptable, and gain many valuable adherents, if we made it clear that we aim, not only at the improvement of the farming industry in all its branches, but also at the profitable and congenial home employment of the farmer's family. The Department are quite alive to this vital element of the question. during which people can work upon the land, and "how to fill the remaining interval, for a population mainly agricultural, with remunerative, wholesome and dignifying occupation is, not only an economic, but a social and moral problem of the highest interest to a nation." The general need, moreover, of not merely educating the people in industrial pursuits, but also of endeavouring to secure that they will find scope for their abilities in industries here at home rather than elsewhere is, of course, evident. We want to make our educational system, not an impetus to emigration, but an element in minimising the exodus from our country. Educated farmers and artisans working in Ireland—such is our ideal.

But it is important here that a clear line of distinction should be drawn between industries that require the labour of the worker all the year round and all the working day—and which are most suitable to urban communities—and industries intended to furnish occupation for the spare time of an agricultural population. It is these latter we are here considering, and it cannot be too clearly understood that such industries should be regarded as subsidiary to agriculture, and that it would be a most unsound course if, for their sake, the tillers of the soil should come to neglect the main industry of agriculture, or the womenkind of the farmer's family give less attention to those duties connected both with the farm and the household, which are the most valuable contribution they can make to the economy of rural life.

This principle borne in mind, the development of home industries in agricultural districts can be pursued with all available energy. The successful introduction of such industries will call for much thought, careful experiment, and patient effort. The Congested Districts Board have shown that much can be done by direct teaching and judicious subsidies. We cannot quite follow in their steps, for we have not nearly the same amount of funds available for this mode of action. On the other hand, we can, to a degree not practicable in the congested area, lean upon private enterprise which, when supplemented by our system of practical education, must after all be the chief factor in the actual creation or development of industries. When the children of the people have had, from the earliest educational stage, the training of the hand and eye, the systematic development of the faculty of observation, and, in the further educational stages, specialised instruction having a direct relation with agricultural and industrial life, we shall have the greatest of all agencies for the development of industries—a trained population. The work of so training the population (as will have been seen, if this memorandum has succeeded in making its meaning clear) has begun already. But it will take some years before this process will have produced its chief result. In the meantime, much may be done by careful local enterprise and initiative, aided by special information, special instruction, and other forms of special aid furnished by the Department. The County Councils must assist in promoting such rural industries as circumstances determine to be suitable to their respective districts. Expert industrial instructors will be provided by the Department for these industries when proper local action has been taken, and the Department will labour to qualify itself to act as, so to speak, the Intelligence Office of the country, for such industrial development.

It would be but a waste of time to give here lists of possible industries, or to discuss their relative suitability to the various parts of the country. Outside the poultry, dairying, and flax industries, there should, let it be repeated, be small home and cottage handicrafts, or industries directly connected with agricultural crops or fruit, such as cider-making, starch-making, fruit preserving, &c. Perhaps one possible notable exception may be mentioned—the woollen industry, which might become a large factory industry in rural districts. But it should be remembered that industries of this latter kind require capital and commercial enterprise for their development. The chief eventual factor to be provided in order to attract capital and enterprise is an industrial class—a class with the habits and methods of industrial life—in a word, a trained labour supply. And education liberally interpreted will prove the principal means to this end.

UNIFORMITY IN PRINCIPLE—VARIETY AND ELASTICITY IN DETAIL.

It may appear strange to some who read this scheme that the Department should in such an important matter have felt justified in propounding one general policy for the whole of Ireland. A little thought upon the objects which it is sought to attain, and the machinery to be set in motion, will show the necessity of proceeding upon well-defined uniform principles in agricultural education. The necessity arises from the nature of all sound educational work, and it is especially felt in connection with that co-ordination which it is so important to establish between the different educational systems of the country. These systems ought to be administered upon uniform principles, and if we were to launch a lot of schemes based upon no definite idea, and having no common principles underlying them, it would be impossible for the other educational authorities, however anxious they might be to do their part in the elevation of our rural life, to extend to us that hearty co-operation, without which any attempt to solve the problem of agricultural education would but make confusion worse confounded.

In thus insisting that the principles upon which we proceed must be uniform, let me make it quite clear that there will be equal necessity for the greatest elasticity in the practical application. Elasticity is dictated by the variety of local conditions to be met with in Ireland—a variety remarkable in proportion to the size of the country. Even excluding the congested districts, we find wholly diverse systems of agriculture, from dairying to flax cultivation, from barley growing to cattle grazing. There will also be the greatest variety in the number of pupils seeking agricultural education, and in the time which it may be necessary to take in the different counties for the various stages of the scheme to mature before further progress is attempted. The teacher difficulty, which will, I fear, be acute for some years, will act as an automatic brake upon any too precipitate educational developments.

CONCLUSION.

I have now discharged, to the best of my ability, the task of submitting, on behalf of the Department, in broad outline, a comprehensive scheme of agricultural education for Ireland. If we gain a general acceptance for what we have thought out, we shall enter upon our task with a force of enlightened public opinion behind the County Councils and the Central Authority, which will ensure the smooth and effective working of the new machinery. I have not attempted to steer a safe course between the two rocks of destructive criticism, upon one or other of which attempts to deal practically with Irish problems are most commonly wrecked. Some will say that the scheme assumes a degree of educational zeal which belonged to generations of Irishmen long ago, which may characterise generations yet unborn, but which is not manifest to-day. I admit that I have formed a high estimate of the educational spirit of my countrymen, and the circulation of this pamphlet among Irish farmers, with the full approval of the Agricultural Board, shows that they are of the same mind. Others who have great influence upon the thought and action of the Irish people have no patience with any partial attempts to deal with national problems, the solution of which, in their opinion, must either await the concession or the abandonment of a political demand. In reply, I have only to say that, by which ever side this view may be put forward we cannot afford to yield to it. The latest Census figures are on all our minds, and tell the tale of a continued exodus even more exhausting in the quality than in the quantity of the drain. We must remember that the phenomenon of a rural exodus is not peculiar to Ireland now: the depletion of rural districts is going on in most European countries. The problem of how to rehabilitate rural life is not exclusively an Irish problem. But in Ireland its solution is of greater urgency than in any other country, for the simple reason that the towns to which our people fly are three thousand miles from our shores. What is but migration elsewhere is emigration here. These considerations clearly indicate the necessity for a many-sided national effort. Happily, the social side of Irish rural life is being brightened by more than one new movement, which, so far from diverting the attention of the rural classes from the urgent need for an improved system of practical education, will incline them to extend a sympathetic hearing to all honest proposals for enhancing the happiness and comfort of Irish families in Irish homes. The scheme I have outlined at least has this end in view. It is conceived, we trust, with a full knowledge of Irish difficulties, of Irish capacities and of Irish sentiment. We rely upon those to whom these pages are addressed to see that it plays a useful part in the upbuilding of our country.

HORACE PLUNKETT.

(4.)

EXTRACT from the FIRST ANNUAL REPORT of the DEPARTMENT of AGRICULTURE and TECHNICAL INSTRUCTION for IRELAND.

(See the evidence of Mr. T. P. Gill, q. 4229).

THE EDUCATIONAL POLICY OF THE DEPARTMENT.

To the educational part of its work the Department looks as the most powerful and abiding means of promoting the end in view. In a country which is so industrially depleted as Ireland, and in which the economic drain is still continuing, the direct measures for improving industry above referred to, however valuable, and however they may extend as the work progresses, and as legislation creates new opportunities, cannot by themselves alone produce very great or deep results, and large expectations based upon them may lead to disappointment. But a proper system of education, which, while paying due heed to the training of the character and the will, will train the intelligence to deal with concrete things as well as with ideas, and which will give to the generation receiving it skill and knowledge that will bring out and make them conscious of their own powers and resources in practical affairs, cannot have disappointing results. Experience has amply proved that it is to the individual and national resourcefulness and the confident character thus developed by an educational system, more than to any other cause, countries which have in recent times achieved marked industrial success owe their progress. The Department, accordingly, feel that however imperfect other forms of effort may be, or whatever the conditions which may prevail in Ireland, if the people be placed in full possession of the benefits of such an educational system, they will have the instrument of their own salvation in their hands. Supplemented by such a system moreover, and directed by a public opinion instructed on economic subjects, all other forms of State action in relation to industry become immensely more effectual. For this reason the Department lay stress on the educational work which they have been commissioned to do in co-operation with the other educational authorities of the country.

The educational duties of the Department include the administration in Ireland of the Grant for Science and

Art (an elastic Parliamentary grant, the amount of which depends on how far it is utilised by schools and classes); the management of institutions for higher teaching in science and art, amongst them the Royal College of Science, the Metropolitan School of Art, the Botanic Gardens, and the Museum; and the organisation of a system of technical instruction applied to industries and agriculture. In undertaking these duties the Department will act on the view that the education of a country should be considered as a whole, and that it is a grievous fallacy to expect sound results from any special scheme which is not made an organic part of the general educational system. The experience of countries which have given most attention to the connection between education and industrial development shows that the best results in this direction are due to the secondary school and the university or higher technical college. When the secondary school, on, at least, one of its "sides," is permeated with the practical spirit, and deliberately related to the real economic and social needs of the country, it becomes possible to produce leaders of industry, that is, men who have learned to apply intellect and science, as well as enterprise, to the callings of commerce, manufactures, and agriculture; and when properly-trained leaders of industry are available for a country reforms in all the grades of practical education inevitably follow. Again, that great undeveloped resource, the latent intellect and artistic and mechanical skill of the working classes of the country cannot be rightly got at until the primary schools, rural and urban, fit their pupils to take direct advantage, whether of the general schools or the technical schools of a complete system, with their respective avenues of progression. There cannot be the most useful educational ambition in a country until the pupil of talent in the humblest elementary school feels that the way is open for him, so far as educational opportunity can open it, to the highest careers in industrial, agricultural, or academic life. The primary school, the secondary school, and the university are thus regarded as having their part to do for what is commonly called technical education, as well as the specially technical institutions.

The Department enters the secondary schools of the country, as the administrator of the Science and Art Grant, principally from the point of view of general education, which is the first concern of the secondary school, and secondarily from the point of view of those specialised applications of education to which the secondary school should lead. With these objects in mind it has entirely changed the system on which the Science and Art grants have hitherto been administered, and rendered these grants, it is hoped, more favourable to freedom and individuality in teaching, and more suitable to Irish conditions. The new Programme of Experimental Science, Drawing, Domestic Economy, and Manual Instruction, which the Department has issued, is intended to provide, in the first two years, the secondary school with that minimum of scientific discipline and training of the hand and eye which educationists now generally hold should be a part of any broadly-conceived scheme of general education. This minimum, it is believed, may be given without injury to the essential function of the humanities in the curriculum of every secondary school. The Department do not desire that Ireland, at this period of transition in her educational history, should fall into the mistake which, it is beginning to be recognised, has been committed elsewhere, of underestimating the value of the human and ethical parts of education, even in the direct production of utilitarian results. The Programme, in its subsequent years, will permit of specialisation according as pupils are intended for various practical callings. Most fortunately for Irish educational reform, the Department have had the full co-operation of the Board of Intermediate Education in this matter. That Board have adopted the Department's Programme, made it part of their own curriculum for the current year, and resolved to accept the inspection and examination of the Department in the subjects which the Programme includes. By this means a great impetus will have been given this year to the introduction of practical features into general secondary education, and the way prepared for specialisation at later stages in technical directions. To facilitate the schools in taking up the new Programme the Department gave a series of special free courses to teachers, this year, in centres in Dublin, Belfast, and Cork. These courses were attended by teachers from 196 secondary schools.

Besides this development of secondary schools, and the promotion of evening continuation schools, to provide for the education of boys whose schooling has been abruptly cut short by their going into employment, the system of the Department will include the establishment, through the medium of existing schools and otherwise, of special Technical Schools for Industries and for Agriculture. In connection with agriculture—apart from the difficulty of getting teachers, which must continue, with diminishing intensity, for a few years, until a supply of expert agricultural teachers has been trained—the organisation of such technical schools presents a comparatively simple problem. Agriculture is a great and living industry, universally pursued in Ireland, and whether these agricultural schools arise in connection with secondary schools, or are independently organised—and probably they will appear in both forms—their problem will be to adapt their teaching to the service of the industry which is at their door. Their chief perplexity will be, how, with most economy and practical effect, to diversify their work so as to suit the different agricultural conditions of different parts of the country, and the different classes of service, that of the working farmer, that of the agricultural scientist, for which knowledge is required.* It is otherwise with technical instruction intended for the purposes of industries other than agriculture. Outside the large cities where Technical Instruction schemes are being successfully inaugurated, there are few towns in Ireland where any such industries exist. Moreover, a striking difference, which it is most important to appreciate, thus appears between the problem of technical instruction in Ireland and that problem in Great Britain. In the towns of England and Scotland technical instruction has but to adapt itself to existing and flourishing manufactures. In no locality does any doubt or question arise about the industries to be served. The scheme of technical instruction is called on to provide its pupils with skill and knowledge, mainly imparted in the evening, to be applied to industries which they are working at during the day. In the majority of the provincial towns of Ireland, beyond the artisans connected with the building trades, there are seldom workers enough engaged in any industry to which technical instruction could properly be applied to furnish pupils for a class at a technical school. This somewhat baffling difficulty, which confronts the Department in the organisation of its educational system, it is desirable to have fully realised. It means that part of the problem of technical instruction in such localities must be, how to promote industries to which it may be applied; and that, consequently, through exceptional Irish necessities, the Department may be obliged to give more attention to this mode of action than it might otherwise have found it desirable to do. It means, moreover, that, outside the large cities, that phase of technical instruction which approaches more nearly to the direct teaching of trades or handicrafts to workers insufficiently prepared in the elements of science and art will for a time have to be more resorted to in Ireland than is the case in more developed countries. But this, in its irregular applications at least, will be but a temporary phase. Technical instruction in its true and permanent conception, as a specialised but organic part of general education, whose aim is so to train a man as to render him morally, intellectually, and physically master of his best aptitudes, and able to apply these aptitudes in every fitting direction that opportunity offers, will always be before the mind of the Department. It is from men so trained, from their inventive brains, their skilful hands, their developed and self-trustful personality, conscious of powers, and seeking for opportunities to use them, that the true advancement of a nation's industries must come. This has been the history of technical instruction, even in countries which, like Ireland, have started without industries, and which have also had to try the temporary phase referred to.

For the purposes of higher technical and scientific education, the Department has under its control, maintained from Imperial funds, the institutions already mentioned, which have hitherto been known as the Science and Art Institutions. It is intended by the Department to remodel and adapt all of these institutions to purposes which it was impossible for them adequately to serve under former circumstances, and to make them living factors in the promotion of practical education and the industries and agriculture of the country. The Royal College of Science, as it has been called up to the present, will, it is proposed, be made the chief technical college for Ireland, a real "polytechnicum" or college of science applied to agriculture

* The lines on which the Department propose to promote a system of agricultural education in Ireland are described in a memorandum by the Vice-President in the Appendices, and are illustrated in the section of the Report under the head of "Agriculture."

DOCUMENTS, II.

and industries; and for this purpose it will be reorganised, provided with new buildings, and equipped in such a fashion as to bring it, at least in quality, level with the best technical colleges. Soon after the Act came into force a Departmental Committee was appointed, by minute of the Vice-President, to consider and report as to the best means of carrying out this reform. This Committee consisted of Sir W. de W. Abney, K.C.B.; Mr. T. P. Gill, Secretary of the Department; Captain T. B. Shaw, then Assistant Secretary in respect of Technical Instruction; Mr. S. E. Spring-Rice, C.B., Auditor of the Civil List; Mr. J. G. Barton, C.B., Commissioner of Valuation for Ireland; Sir James Musgrave, Bart., of Musgrave Bros., Belfast; and Mr. W. B. Harrington, of Harrington & Co., Cork. Their labours resulted in a detailed Report, which will be a valuable guide to the Department in reorganising this College. The Metropolitan School of Art, when, in due time, it is reconstituted and brought into full activity in the work of the Department, ought to become what Ireland has so long lacked, a centre of life and inspiration for Irish Art, and especially for Irish Art applied to industry. The Irish people are said by those who have special knowledge of artistic handicrafts to possess still the aptitudes which the collection of Irish antiquities in the Museum shows to have belonged to their ancestors; and it is quite probable that in the class of industries in which the individuality of the worker imparts a special element of value, they may achieve particular success. A national School of Art, encouraging local freedom, aiming at distinctive national qualities, having at its hand, as part of its inspiration, the beautiful and suggestive objects in the Museum, taking its place in a system of education in which the teaching of Art was sympathetically encouraged in every part of the country, might have a great influence on Art and industries in Ireland; and such a centre it is hoped what is now called the Metropolitan School of Art may become. The Science and Art Museum, in Kildare-street, which already possesses collections of great value to the interests of science, industries, and art, and the other Institutions will be developed similarly, so as to assist in their several ways the work with which the Department has been entrusted. Detailed Reports dealing with the year's work of the Royal College of Science, the Museum of Science and Art, the National Library, and the Botanic Gardens, have already been issued by the Department, and are reprinted as an appendix to the present Report.

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(5)

EXTRACT from the Directory of the ROYAL COLLEGE of SCIENCE for IRELAND.

(See the evidence of Mr. T. P. Gill, q. 4040).

PROGRAMME FOR THE SESSION 1901-1902.

Nature of Instruction.

1. The Royal College of Science supplies, as far as practicable, a complete course of instruction in Science applicable to the Industrial Arts, especially those which may be classed broadly under the heads of Engineering and Manufactures, and in Physics and Natural Science, and in Agriculture, and is intended also to aid in the instruction of Teachers of Science.

Duration of Session.

2. The Session commences on the first Tuesday in October, and lasts until first Friday after June 18. Vacations of one fortnight at Christmas, and from the Thursday before Easter till the second Monday following, inclusive.

3. The First Term commences on the first Tuesday in October, and the Second Term on the first Monday in February.

4. All Classes in the College are open to Ladies.

5. Students may enter as Associates or Non-Associates. By "Associate Students" is meant all those who enter for the three years' curriculum of the College.

DIPLOMA OF ASSOCIATE OF THE ROYAL COLLEGE OF SCIENCE FOR IRELAND (A.R.C.Sc.I.)

Associate Students.

6. The course of instruction for Students desirous of obtaining the Diploma of Associate of the Royal College of Science extends over three years, each year being divided into two Terms. In the first year the instruction is general. In the following years it is specialised according to the Faculty selected.

QUALIFICATION OF SCIENCE TEACHERS.

Science Teachers.

7. The qualification by examination to teach Science subjects under the Department of Agriculture and Technical Instruction for Ireland and Board of Education, South Kensington, is dispensed with in the case of Associates; and in the case of Non-Associates a Certificate of this College is recognised as qualifying a Science Teacher under the Board of Education and under the Department of Agriculture and Technical Instruction for Ireland to teach the subject or subjects named in the Certificate, and to earn grants thereon. (See the Directory of the Board of Education.)

ASSOCIATESHIP.

Entrance Examination.

8. Students intending to enter for the Associateship will be required to pass an Entrance Examination towards the end of the preceding Session or the first day of the Session for which the Student wishes to enter, in the following subjects:—

ELEMENTARY MATHEMATICS.—*Arithmetic*, including simple interest and use of Logarithm Tables; *Algebra*, including simple equations; *Plane Geometry*, including the two first Books of Euclid.

ELEMENTARY PRACTICAL GEOMETRY, including the use of the drawing pen, with Indian ink, compasses, set square, and T square.

9. The Examination is partly written and partly oral, and commences each day at 10 A.M.

10. No Student will be required to pass the Examination who can show by certificates that he has already passed the Science and Art Examinations of the Board of Education, or those of any other recognised Institution, in these subjects. The production of satisfactory Drawings executed by the Candidate will exempt from Examination in Elementary Practical Geometry.

Diplomas.

11. The Diploma of Associateship of the College, A.R.C.Sc.I., is given to Students who have attended three-fourths of the number of Lectures in each of the three years, and have passed in all the subjects of the first year, and in those of any one division of the second and third years. In their respective divisions they will be required to take the "Pass with Credit," in their final Examinations, in the following subjects:

12. FACULTY OF ENGINEERING.

Applied Mechanics and Hydrodynamics, Engineering, Drawing.

FACULTY OF MANUFACTURES.

Advanced Chemistry, Analytical Chemistry.

FACULTY OF PHYSICS.

Physics and Practical Physics, including Electrotechnology.

FACULTY OF NATURAL SCIENCE.

Zoology, Botany, and Geology.

ASSOCIATE COURSES AND FEES.

Fees for Associate Students.

13. Students entering for the purpose of obtaining the Diploma of Associate, or intending to compete for the Scholarship, are required to attend the courses as given below and in the Time Tables, and to pay the prescribed fees:—

FIRST YEAR.—(For all Faculties).

1st Term.

Pure Mathematics (Lectures).
Do. (Exercises).
Descriptive Geometry and
Geometrical Drawing,
Chemistry (Lectures).
Chemical Laboratory.
Freehand and Model Drawing at Metropolitan School of Art.

Fees for 1st Term—£9.

2nd Term.

Pure Mathematics (Exercises).
Mechanics (Lectures).
Physics (Lectures).
Physical Laboratory.
Mechanical Drawing.
Freehand and Model Drawing—*continued.*

Fees for 2nd Term—£9.

Total 1st Year—£18.

14. In their second and third years Associate Students are required to attend all the courses of any one Division, and to pay the prescribed fees, as follows:—

FACULTY OF ENGINEERING.

SECOND YEAR.

1st Term.

Mathematics (Lectures).
Do. (Exercises).
Mineralogy (Lectures).
Mineralogical Laboratory.
Physics (Lectures).
Physical (Laboratory).
Machine Construction (Lectures).
Mechanical Drawing.

Fees—£12.

2nd Term.

Mathematics (Exercises)—*continued.*
Mechanics (Lectures).
Mineralogical Laboratory—*continued.*
Machine Construction (Lectures)—*continued.*
Mechanical Drawing.

Fees—£3.

Total for 2nd Year—£15.

THIRD YEAR.

1st Term.

Mechanism and Thermodynamics (Lectures).
Applied Mechanics and Hydrodynamics (Lectures).
Engineering (Lectures).
Drawing and Testing Materials.
Geology (Lectures) including Palæontology (Demonstrations).
Geological Laboratory.

Fees—£13.

2nd Term.

Mechanism and Thermodynamics (Lectures)—*continued.*
Applied Mechanics (Lectures, &c.)—*continued.*
Engineering (Lectures)—*continued.*
Surveying (Lectures and Field Work).
Surveying (Drawing School Practice).
Geology and Palæontology—*continued.*

Fees—£3.

Total 3rd Year, Faculty of Engineering—£16.

FACULTY OF MANUFACTURES.

SECOND YEAR.

1st Term.

Mathematics (Lectures).
Do. (Exercises).
Mineralogy (Lectures).
Mineralogical Laboratory.
Physics (Lectures).
Physical (Laboratory).
Machine Construction (Lectures).
Mechanical Drawing.

Fees—£12.

2nd Term.

Mathematics (Exercises)—*continued.*
Mechanics (Lectures).
Mineralogical Laboratory—*continued.*
Advanced Chemistry (Lectures).
Chemical Laboratory.
Machine Construction (Lectures)—*continued.*
Mechanical Drawing.

Fees—£8.

Total 2nd Year, Faculty of Manufactures—£20.

THIRD YEAR.

1st Term.

Mechanism and Thermodynamics (Lectures).
Chemical Laboratory.

£12.

2nd Term.

Mechanism and Thermodynamics (Lectures)—*continued.*
Chemical Laboratory—*contined.*

Total 3rd Year, Manufactures—£12

FACULTY OF PHYSICS.

SECOND YEAR.

APPLIED PHYSICS.

1st Term.

Mathematics (Lectures).
Do. (Exercises).
Mineralogy (Lectures).
Mineralogical Laboratory.
Physics (Lectures).
Physical Laboratory.
Machine Construction (Lectures).
Mechanical Drawing.

Fees—£12.

2nd Term.

Mechanics (Lectures).
Mathematics (Exercises)—*continued.*
Physical Laboratory.
Machine Construction (Lectures)—*continued.*
Mechanical Drawing.
Mineralogical Laboratory—*continued*

Fees—£6.

Total 2nd Year, Applied Physics—£18.

THIRD YEAR.

APPLIED PHYSICS.

1st Term.

Mathematical Physics (Lectures).
Mathematics (Exercises).
Mechanism and Thermodynamics (Lectures).
Physics (Tutorial).
Physical Laboratory, Electrotechnology.

Fees—£15.

2nd Term.

Mathematical Exercises—*continued.*
Mathematical Physics (Lectures)—*continued.*
Mechanism, &c. (Lectures)—*continued.*
Physics (Tutorial)—*continued.*
Physical Laboratory—*continued.*
Surveying (Lectures and Field Work).
Surveying (Drawing School Practice).
Fees—£3.

Total 3rd year, Applied Physics—£18.

SECOND YEAR.

PHYSICAL SCIENCE.

1st Term.

Mathematics (Lectures).
Do. (Exercises).
Mineralogy (Lectures).
Mineralogical Laboratory.
Physics (Lectures).
Physical (Laboratory).
Fees—£13.

2nd Term.

Mechanics (Lectures).
Mathematics (Lectures and Exercises)—*continued.*
Physical Laboratory—*continued.*
Chemistry (Lectures).
Chemical Laboratory.
Mineralogical Laboratory—*continued.*
£7.

Total 2nd year, Physical Science—£20.

FACULTY OF NATURAL SCIENCE.

SECOND YEAR.

1st Term.

Mathematics (Lectures).
Do. (Exercises).
Mineralogy (Lectures).
Mineralogical Laboratory.
Zoology (Lectures).
Zoological Laboratory.
Botany (Lectures).
Botanical Laboratory.
Fees—£13.

2nd Term.

Mineralogical Laboratory.
Advanced Chemistry (Lectures).
Chemical Laboratory.
Botany (Lectures)—*continued.*
Botanical Laboratory.
Fees—£8.

Total 2nd year, Natural Science—£21.

THIRD YEAR.

1st Term.

Geology (Lectures), including Palæontology (Demonstrations).
Geological Laboratory.
Zoology (Lectures).
Zoological Laboratory.
Fees—£9.

2nd Term.

Geology and Palæontology (Lectures)—*continued.*
Geological Laboratory.
Botany (Lectures).
Botanical Laboratory.
Fees—£7.

Total 3rd year, Natural Science—£16.

Scholars and Exhibitioners admitted free.

15. The above Fees include all the courses of the respective years.

The Fees are in all cases payable in advance.

The holders of Royal Scholarships, Royal Exhibitions, or National Scholarships pay no Fees.

NON-ASSOCIATE STUDENTS.

16. Students may enter for separate courses, and receive Certificates after Examination, if they have attended two-thirds of the Lectures. A Certificate of Attendance is not given for any Laboratory course of less than three months.

SESSIONAL EXAMINATIONS.

Sessional Examinations.

17. The Examinations are held at the end of the First Term for certain of the Courses which then terminate, and at the end of the Session for the remainder, and are conducted by Papers set partly by Examiners appointed by the Department, and partly by the Professors of the College.

Marks.

18. The minimum number of marks required for the several grades is as follows:—

1st Prize,	75	per cent. of total marks attainable.
2nd ,,	60	,, ,, ,, ,,
Pass with credit,	50	,, ,, ,, ,,
Pass,	33	,, ,, ,, ,,

19. A second prize is not awarded unless more than five Students present themselves for Examination.

20. All Students present at the Examinations are expected to be in attendance, and to work in the Laboratories or Drawing School until the results are declared, unless leave of absence be given for good and sufficient reasons.

21. An Associate Student of the First Year who fails in the Sessional Examination of that year in one or more subjects, will be permitted to complete such First Year's Course by re-entering the College in the following Session for the purpose of studying those subjects in which he failed, and passing the Sessional Examinations therein.

Such Student will not be required to attend courses of instruction in those subjects in which he passed during his first Session. Should he do so, he will be required to pay the fee prescribed for each Course he attends.

An Associate Student thus allowed to complete his First Collegiate Year, is ineligible for the Medal or Royal Scholarship offered for competition on the completion of the First Collegiate Year. Such Student is, however, eligible for prizes awarded upon the results of the Sessional Examination in any subject which he re-attends. But any student who has failed in the first year and pays for and takes the full first year's course again is eligible for the Medal and Royal Scholarship.

Inspection of Note Books.

22. In all examinations the Candidate's note-books and drawings are to be laid before the Council.

FEES FOR NON-ASSOCIATES.

Fees for Non-Associate Students.

23. The Fees payable by Non-Associate Students are:

LECTURES.

Any Course of Lectures, £2.

PRACTICAL WORK.

Chemical Laboratory—
£2 for a special Course of one month.
£5 for three months.
£9 for six months.
£12 for the entire Session.

Assaying—
£5 for three months.
£9 for six months.
£12 for the entire Session.

Physical Laboratory—
£2 for a special Course of one month.
£5 for three months.
£12 for the entire Session.

Zoological Laboratory—
£2 for a special Course of one month.
£3 ,, ,, 2nd Year's Course, as in the Faculty of Natural Science.
£4 for a Third Year's Course, as in the Faculty of Natural Science.
£5 for a special Course of three months.

Botanical Laboratory—
£1 for a special Course in Part III.
£2 for a special Course of one month.
£3 ,, ,, Parts I.-III.
£5 ,, ,, three months, or in Parts I.-IV.

Geological and Mineralogical Laboratory.
£1 for the Course of Palæontological Demonstrations.
£2 for a special Course of one month.
£2 for a Course as in the Faculty of Engineering.

Drawing School—
£5 for the Session, or £3 for one Term, including Surveying (Field Work).
£1 Surveying (Field Work).

Mathematical Exercises.
£2 per Session, any Course.

24. Non-Associate Students attending Laboratory Courses in any subject will do so at hours to be arranged with the Professors concerned.

Continuation of Short Courses.

25. Students taking a short Laboratory or Drawing School Course will be allowed to extend it on paying the difference fifteen days before the expiration of the Course paid for.

Courses applicable to University Students.

26. The Courses of Chemistry, Physics, Botany, Zoology, Geology, and Mineralogy are recognised by the Royal University of Ireland. They are for the most part so arranged as to cover the Course prescribed for the 1st Medical and 2nd Arts Examinations, and Certificates of Attendance are granted to Medical and other Students attending the Courses of Lectures, and the Laboratories.

A Special Register will be kept of such Students' attendance.

27. The Courses of Botany and Zoology are also recognised by the University of Edinburgh.

28. Advanced Students attending special courses or engaged in research will have every facility for study, including direction in their reading.

Prizes, Scholarships, Medal.

Prizes.

29. Prizes of the value of £2 and £1 may be awarded in the several subjects of instruction to approved Candidates upon the result of the Sessional Examination. These prizes are open to both Associate and Non-Associate Students.

Scholarships.

30. Four Royal Scholarships, each of the value of £50 yearly, with free admission to the Lectures and Laboratories, are attached to the College. *Two* are offered for competition *each year* to Associate students, not being Royal Exhibitioners or National Scholars, on the completion of their first Collegiate year. In order to qualify for them a student must attend at least three-fourths of the Lectures and Demonstrations of the first year, and pass in all the subjects of that year, and in at least two of them the Pass must be "with Credit." The holders of the Scholarships are required to attend with strict regularity all the courses of their respective years, and to pass the Sessional Examinations.

Medal.

31. A Silver Medal is annually awarded at the end of the first year to the Student who gains the highest number of marks at the Sessional Examinations.

32. All Prizes must be claimed before the 1st February following the date of award, otherwise they will be forfeited.

33. Any Scholarship or Medal may be withheld should none of the Candidates have attained a sufficiently high standard of merit at the Examination.

Royal Exhibitions.

Exhibitions, National Scholarships, and Admissions at Reduced Fees to the Royal College of Science for Ireland.

34. There are nine *Royal Exhibitions* of the value of £50 per annum, entitling the holder to free admission to all the lectures, and to the Laboratories, to be held from year to year for three years, on the condition that the holder attends the Lectures regularly during those years, and passes the Examinations required for the Associateship of the College.

35. Three of the above Royal Exhibitions are awarded annually to the College, and are open for competition annually at the May Examinations of the Board of Education, South Kensington. The conditions under which they are obtainable will be found in the Directory of the Board of Education, which may be obtained on application to the Secretary, Board of Education, South Kensington, S.W.

36. There are free Teacher Studentships for three years' Course in Science and Teachers of Technical Schools, and for Itinerant Instructors in Agriculture.

National Scholarships

37. *Sixty-six* National Scholarships have been instituted by the Board of Education, South Kensington, of which *twenty-two* are open for competition annually, at the May Examinations, to Students of the Industrial Classes, as defined in the annual Directory of the Board. They are of the value of 30s. a week during the Session, and are tenable for three years at the Royal College of Science, Dublin, or the Royal College of Science, London, at the option of the holders. They entitle the holders to free admission to all the Lectures and to the Laboratories, with third-class railway fare to and fro, for one journey, each session, between the home of the scholar and Dublin or London, as the case may be.

Science Teachers

38. Any *bonâ fide* Teacher who is qualified to earn payments on results for teaching Science, according to the terms of the Science Directory, may attend any Associate Course of Lectures at the College, on paying a fee of £1 for examination in each course attended.

Regular attendance necessary.

39. Exhibitioners, and all Students admitted free or at reduced fees, are required to attend with strict regularity all the courses of their respective years (unless exempted by special permission of the Council), to conform to the rules of the College, and to pass the Sessional Examinations. In case of illness a medical certificate must at once be forwarded to the Secretary.

Library.

Library.

40. The Library contains carefully selected works relating to the subjects in which instruction is given; it is open to the students, on week-days from 10 a.m. to 5 p.m., and from 7 to 10 p.m., on Tuesdays and Thursdays, and also to the public under certain conditions fixed by the Council.

Voluntary Courses.

Extra and Special Courses.

41. Systematic Evening Courses on various branches of Science are voluntarily given by Professors or other members of the Staff during the Session.

Courses for teachers are organised during the Summer Vacation in the month of July.

SYLLABUS.

EXPERIMENTAL PHYSICS.

Professor W. F. BARRETT, F.R.S., F.R.S.E., M.I.E.E., M.R.I.A., J.P.

Assistant to Professor of Physics, WM. BROWN, B.Sc., A.M.I.E.E.

FIRST YEAR.

GENERAL PHYSICS.

Properties of Matter and Energy in General.

Space, Time, and Mass.—Measures of *space*—The metric system—Instrumental means for measuring minute spaces—The Microscope, Vernier, Screw-Micrometer, Dividing Engine, Spherometer, Cathetometer, Optical Lever. Units of length area, and volume. Measures of *time*—Exact means of measuring intervals of time—Clocks, Chronometers, Chronoscopes, Chronographs—Velocity—Acceleration. Measures of *mass*—Weight and mass—The Balance—Fundamental units of length, mass, and time.

Force.—Definition—Measurement of forces—The force of gravity—Laws of falling bodies—Atwood's machine—The pendulum.

Energy.—Definition—Transmutation of energy—Potential and kinetic energy—Conservation of energy—Classification of energy—High and low class energies—*Availability* of energy—Sources of terrestrial energy.

Matter.—Its essential properties.—Elements and compounds. Molecules and Atoms.

Properties of Solids. — Elasticity — Tenacity—Rigidity—Viscosity.

Mechanical properties of Fluids.—*Hydrostatics*—Definition of a fluid—Distinction between solids and

fluids in the transmission of pressure—Hydraulic press —Pressure of a fluid due to its weight—Pressure proportional to depth—Pascal's vases—Upward and lateral pressure—Hydrostatic bellows—Spirit levels—Artesian wells—The siphon—Pressure of liquids on immersed bodies—*Specific gravity*—Hydrometers—Determination of the densities of solids and liquids; of bodies in powder, of bodies soluble in water, &c.—Density of gases.

Pneumatics—Weight of bodies in air and in vacuo—The Balloon—Atmospheric pressure—*The Barometer* —Mercurial, water, and aneroid barometers—Corrections and reductions of barometric readings—Self-registering barometers—Height of homogeneous atmosphere or pressure height—Determination of heights by the barometer: hypsometry—Boyle's law—Air Manometers.

Pneumatic and Hydraulic machines—The air pump —Use of valves—Calculation and measurement of elastic force of residual air—Mercury pump—Compressing pump—Lift pump—Force pump—Water-ram—Water engines—Turbines.

HEAT.

THERMOMETRY.—Effects of heat upon bodies—The quantity of heat in a body to be distinguished from its hotness—Thermometry and calorimetry—Choice of thermometric substance—Construction of a thermometer—Thermometric scales—Sources of error in a thermometer and their correction—Maximum and minimum thermometers—Pyrometers.

DILATATION.—*Expansion of Solids*—Methods of determination—Linear and cubical expansion—Force of expansion—Applications of expansion—Compensating pendulums—Chronometers. *Expansion of liquids*—Methods of measurement—Apparent and absolute expansion—Laws of liquid expansion—Expansion of water. *Expansion of gases*—Methods of measurement —Law of Charles—Change of volume or pressure of a gas by change of temperature—The air thermometer—Absolute zero, absolute temperature.

CALORIMETRY.—Unit of heat—Definition of *specific heat*—Methods of determining specific heat—Calorimeters—*Specific heat of solids, liquids and gases.*

TRANSFERENCE OF HEAT.—Convection—Conduction—Radiation and Law of Cooling.

Convection.—Diffusion of heat by effect of gravity —Dilatation of bodies by heat, and mobility of particles of fluids. *Convection in liquids*—Heating by hot water—Maximum density of pure water—Joule's method of determination by convection—Maximum density of sea water—Oceanic currents, the Gulf Stream, &c. *Convection in gases*—Land and sea breezes—Trade winds—Attraction of light bodies produced by convection—Effect of rarefaction—High convective power of hydrogen.

Conduction.—Diffusion of heat by conduction—Definition of specific thermal conductivity—Variable and steady flow of heat—Practical applications of conductivity—Davy lamp.

Principal Laws of *Radiation.*

CHANGE OF STATE.—*Passage of a solid into a liquid.* —Internal work—Constant temperature during fusion—Table of melting points—*Latent heat* of *liquefaction*—Determination of latent heat of water.

Passage of a liquid into a solid—Heat evolved during congelation—Expansive force of ice.

Passage of a liquid into a gas.—Heat absorbed in evaporation—*Latent heat of vaporization*—Constant temperature during ebullition—Table of boiling-points —Hypsometer—Effect of pressure on boiling-point—Geysers—*Passage of a gas into a liquid*—Distillation —Cryophorus.

Maximum pressure of vapours—Elastic force of vapour in contact with its own liquid—Measurement of maximum pressure—Vapour pressure of different liquids—Dew point—Daniell's and Mason's Hygrometers.

NATURE OF HEAT.—Conversion of work into heat—Rumford's and Davy's experiments—Joule's experiments—Mechanical equivalent of heat.

SOUND.

The generation of sound.—Vibration—Physical cause of the distinction between noise and musical tones—Periodic and non-periodic motions.

The propagation of sound—A material medium necessary—Experiment of the Florentine academicians—The decay of sound—Law of distance—Use of speaking tubes and speaking trumpets—The conduction and reinforcement of sound—The Stethoscope—*The velocity of sound*—Experimental determinations.

Wave motion—Water waves and air waves—Transverse and longitudinal waves—Motion of a particle in a wave—The reflection of sound—Echo—Conjugate mirrors—The absorption of sound—The refraction of sound—*Amplitude, length,* and *form* of waves generated by *extent, rate,* and *mode* of vibration—*Loudness, pitch,* and *quality* of musical tones.

Musical tones—Vibration number, and vibration period—Determination of vibration number by the Siren and by the Phonautograph—Wave length—Upper and lower limits of audible musical tones—The gamut or diatonic scale.

Resonance—Law of sympathetic vibration—Resonance of tuning forks, strings, and membranes—Resonance of air—Resonators—Whistles—Pan pipes —Resonance of flames—Singing flames—Sensitive flames and their acoustic value.

Vibration of strings—Velocity of pulse along a chord —Laws of the transverse vibration of strings and their experimental illustration—The monochord—Musical tones of strings—Harmonics of a string.

Vibration of fluids—Longitudinal vibration of liquids and gases—Determination of the velocity of sound in these bodies—Organ pipes—Embouchure—Musical tones of flue pipes—Harmonic upper partials—Use of manometric flames—Construction of the organ—Open and stopped pipes.

The organ of voice—Reed pipes—The harmonium—The concertina.

LIGHT.

Propagation of light—Sources of light—Divergent emission—Rectilinear propagation—Images formed by apertures—Shadows—Decay of light by distance—Law of inverse squares—Brightness—Law of illumination —Photometry—Rumford's and Bunsen's Photometers —Velocity of light through space and its determination —Aberration of light—Velocity of light in water.

Nature of light—Guesses of the ancients—Newton's material theory—Reasons for its rejection—Huyghen's undulatory theory—Reasons for its acceptance.

Reflection of light from plane surfaces—Law and theory of reflection—Scattering of light and law of incidence—Image of reflected object—Lateral inversion —Inclined mirrors—Multiple images—The kaleidoscope—Motion of mirror and image—The sextant and quadrant—Goniometer—Heliostat.

Reflection from curved surfaces—Concave mirrors— Principal and conjugate focus—Reversibility of rays— Determination of focal length theoretically and experimentally—Real and virtual foci—Formation of images —Calculation of magnitude, distance, and nature of image—Linear and angular aperture of mirror—Spherical aberration—Convex mirrors.

Refraction of light by plane surfaces—Transparency —Amount of refraction and its measurement by different methods—Descartes' law—Index of refraction— Reason why a ray is refracted according to the emission and the undulatory theory—Oblique incidence of wave front—Ratio of velocities—Total reflection—Limiting angle.

Refraction through Prisms and Lenses—Direction of ray within a prism—Angle of least deviation—Converging lenses—Determination of foci—Real and virtual images—Diverging lenses—Spherical aberration of lenses.

Optical instruments—Magic lantern—Camera obscura—Photographic camera—Microscopes—Magnifying power—Opera glass—Telescopes.

The eye—Its structure—Cause of erect and distinct vision—Limit of clear vision—Power of accommodation—Long and short-sightedness—Spectacles.

Dispersion of light—Analysis of white light by the prism—Pure and impure spectrum—Synthesis of white light—Dispersive power—Chromatic aberration—Circle of least aberration—Achromatic combination of lenses.

Absorption of light—General and selective absorption. —Colours of flowers, &c.—Pure and impure colours— Complementary colours—Phosphorescence—Spectrum analysis—The Spectroscope.

MAGNETISM.

The natural magnet or lodestone—Origin of the name magnet—Attractive and directive force of lodestone— Distinction between magnetic and electric attraction.

Communication of magnetism—The magnetic metals —Artificial magnets—Methods of magnetization and

demagnetization—Compound magnets—Mutual action of magnets—Fundamental law.

Magnetic measurement—Distribution of free magnetism along a magnet—Curve of magnetic intensity—Magnetic poles, axis, equator, and field—Law of distance—Magnetic moment—Fracture of magnets.

Magnetic induction—Temporary magnetization of soft iron—Coercive force—Function of the armature or keeper of a magnet—Reaction of ends of magnet—Magnetic curves — Consequent points — Equipotential surfaces and lines of force.

Dia-magnetism—Faraday's discovery — Action of magnetism on all bodies—Heavy glass and bismuth—Dia-magnetic and para-magnetic bodies—Behaviour of liquids and gases.

Terrestrial magnetism—Proofs of magnetism of earth—Earth's force simply directive—Construction and use of land and sea compass—Azimuth compass—Terrestrial magnetic poles—The magnetic elements: Declination, Inclination, Intensity—Inclinometers and Declinometers—Kew dip-circle—Determination of intensity—Horizontal and vertical force.

ELECTRICITY.

FRICTIONAL ELECTRICITY.—Development of statical electricity by friction of solids, liquids, and gases—Necessity of difference in molecular structure between rubber and rubbed body—Conduction of electricity by solids and liquids—Insulation—Dual nature of electricity—Equal and opposite quantities of Electricity always co-exist—Theories of Electricity.

Electric quantity and potential— Definition of these terms—Relation between potential and work done—Analogy of potential to level of water or to temperature—Unit potential—Difference of potential.

Electroscopes and Electrometers.—Idiostatic and Heterostatic electrometers—Gold leaf electroscope—Measurement of electricity—Unit quantity—Coulomb's torsion balance—Peltier's electrometer—The quadrant electrometer.

Distribution of electricity—Exterior and interior surfaces of charged body—Electric density: or amount of charge per unit surface—Density of electricity on conductors of various shapes—Equipotential surfaces—Power of points, flame and dripping water—Dissipation of electricity.

Electric Induction.—Influence of electricity on surrounding bodies—Existence of charge implies equal and opposite induced charge—Faraday's theory of induction—Free and bound electricity—Charge by induction—Electric capacity—Di-electrics—Specific inductive capacity—The Electrophorus—Continuous electrophorus—The replenisher.

Electric machines—Cylinder and plate machine—Winter's machine — Bertsch's machine — Induction machines.

Electric condensation.—Increase of electric density without increase of potential—The condenser—Electric images—Condensing electroscope—Capacity of condenser—The Leyden jar—Charge by cascade—Unit jar—Residual charge—Leyden battery.

Electric discharge—i. By conduction, silent discharge—ii. By convection, glow, and brush discharge—iii. By disruption, spark discharge—Effect of pressure on discharge— Discharge in rarefied media—Effect of perfect vacuum—Effect of high temperature on discharge—Difference between positive and negative discharge—Lichtenberg's figures — Physiological, heating and luminous effects of discharge—Velocity of electric discharge—Current induction by discharge—Currents of different orders.

Development of electric potential by molecular actions—Electricity produced by contact, pressure, cleavage, and solidification of insulators—Electricity produced by change of temperature in hemihedral crystals—Pyro-electricity—Electric polarity of tourmaline, &c.—Electricity produced by contact of dissimilar metals—Zamboni's pile—Galvani's experiment—Electricity produced by chemical difference—Identity of electricity, however produced.

CURRENT ELECTRICITY.

Electro-motive Force—Rapid generation of difference of potential — Electro-motive force — Discussion of theories of contact and chemical action—Electric potential, the result of contact of dissimilar molecules—Inability of such permanent contact to sustain electro-motive force—Consumption of heat, or mechanical or chemical energy in maintaining electric flow.

Voltaic Batteries—Volta's pile, and "couronne des tasses"—Electro-motive series of metals—Faraday's researches—Definition of terms *current, pole, electrode, anode, kathode, electrolysis*, &c.—Local action: amalgamation—Polarization: secondary currents—Gas battery—Smee's, Daniell's, Grove's, Bunsen's, Leclanché's, and other cells—Comparative value of different cells.

Electrolysis—Historical sketch—Decomposition of water—Definite direction of radicals—Molecular theory of electrolysis—Davy's electro-chemical discoveries—Laws of electrolysis—Table of electro-chemical equivalents—Faraday's researches—Voltameter—Electrolysis of salts—Secondary chemical action—Electro-metallurgy—Electro-plating and electrotyping—Relation between work done by current and electrolysis—Secondary batteries of Planté, Favre, &c.—The storage of electric energy.

Galvanometers—Means of detecting current electricity—Oersted's discovery—Relation of electricity and magnetism—Determination of direction of current, and of current strength—Tangent galvanometer—Sine galvanometer—Differential galvanometer—Astatic system—Thomson's mirror galvanometer—Volt-meters and Ampère-meters—Calibration of galvanometer.

Resistance—Definition of resistance—Specific resistance—Rheostat—Resistance of solids and liquids—External and internal resistance in battery circuit—Size of plates—Ohm's law—Arrangement of cells in battery—Divided circuits — Shunts — Wheatstone's bridge — Measurement of resistance and electro-motive force—Units of resistance, of potential, of capacity, and of current.

Heating effects of current—Distribution of heat in circuit—Joule's law—The Voltaic arc—Regulators of the electric light—Electric lighting; arc lights and incandescent lights.

Thermo-electricity — Seebeck's discovery — Electro-motive force generated by difference of temperature in junctions of two dissimilar metals—Thermo-electric series.

Electro-dynamics—Action of currents on currents—Fundamental laws—Ampère's rectangle—Rotation produced by currents—Barlow's wheel—Faraday's rotations—Solenoids: their declination and dip—Action of magnets on solenoids—Ampère's theory of magnetism by molecular currents.

Electro-magnetism—Magnetization of iron by current—Electric bells—Electric clocks—Automatic recorders—Chronoscopes.

Electric telegraph—Historical summary—Essentials in every telegraph—Single needle telegraph—Function of earth plates—Dial telegraphs—Morse instrument and code—Morse sounder.

Text Book. Each student must provide himself with a copy of the Cambridge Natural Science Manuals, and Thompson's Electricity and Magnetism, together with Brown's Examples in Physics with Solutions, Part I., and Barrett and Brown's Practical Physics, Part. I.

Students are expected also to consult the special works which will be recommended under each subject.

SECOND YEAR.

GENERAL PHYSICS.

THE MOLECULAR PROPERTIES OF MATTER.—The states of matter. Continuity of these states. Andrew's experiments. Critical temperature. Piezometer: measurement of the coefficient of the compressibility of liquids. Internal friction. Viscosity of solids. Tresca's experiments. Motion of glaciers. Viscosity of liquids. Viscosity of gases. Transpiration of gases. Effusion of gases. Diffusion of gases. Laws of diffusion. Osmose of liquids and gases. Osmotic pressure. Solution. Surface tension. Plateau's experiments. Measurement of surface tension. Capillarity and its laws. Capillary constants of liquids. Angle of contact. Spreading of oil over water. Cohesion figures. Formation of soap films. Surface rigidity and surface contamination of liquids. Liquid veins. Savart's investigations.

THE CONSTITUTION OF MATTER.—Kinetic theory of gases. Vortex-ring theory of atoms. Molecular magnitudes. Radius of molecular action. Rücker and Reinold's researches. Methods of estimating the mass, size, and velocity of atoms. Crookes' experiments. Cathode Rays. The Radiometer. The "Trevelyan Rocker," the "Spheroidal State," and the so-called Crooke's force. Quasi-Thermal Conductivity of gases at low pressures.

HEAT.

CONDUCTIVITY—Flow of heat through a wall—Definition of specific thermal conductivity—Variable and steady flow of heat— Determinations of conductivity—Similarity of thermal and electric conductivity of bodies—Conductivity of rocks—Underground temperatures—Conductivity of liquids—Apparent absence of conductivity in gases cooling in Hydrogen.

CALORIMETRY—Methods of determining specific heat—Corrections—Method of condensation—Joly's Calorimeter—Dulong and Petit's law—Atomic heat—*Specific heat of liquids*—Value of high specific heat of water—*Specific heat of gases*—Difference between specific heat of gases at constant *pressure* and constant volume—Work performed by expanding gas. Mayer's calculation of the mechanical equivalent of heat.

CHANGE OF STATE.—Solution—Freezing mixtures or Cryogens—Crystallization—Super-saturated solutions—Tomlinson's experiments—Change of volume by solidification—Carré's machines—Table of freezing-points—Effect of pressure on freezing-point—Glaciers and their explanation—Regelation Measurement of maximum vapour pressure of different liquids at different temperatures—Dalton's Laws—Regnault's and Dine's Hygrometers.

PYROMETRY—Measurement of high temperatures—Method of expansion or contraction—Air pyrometers—Method of calorimetry—Method of electric resistance—Callender's pyrometer—Vapour density pyrometers—Optical Pyrometers — Thermo-electric pyrometers—Chatelier's couple — Recalescence — Temperature and structure of flames.

SOUND.

The velocity of sound—Experimental determinations—Theoretical determination—Velocity of sound compared with that of a body falling under the influence of gravity—Newton's investigation—Difference between theoretical and experimental value of the velocity of sound in gases—Laplace's correction—Regnault's researches—Velocity of sound in liquids and isotropic solids— Velocity of sound in crystals and wood.

Wave Motion—Transverse and longitudinal waves—Simple harmonic motion—Composition of simple harmonic motions—Reflection, refraction, and interference of waves— The superposition of waves—Principle of the superposition of small motions—Difference of phase—Secondary waves—*Amplitude, length*, and *form* of waves.

Analogy of sound and light—Loudness the analogue of brightness, pitch the analogue of colour—Correspondence between the gamut and the spectrum—The reflection of sound—The absorption of sound—The refraction and inflection of sound—Difference between acoustic and optical transparency of the atmosphere—Fog signals—The effect of wind on audibility of sound.

Transverse vibration of rods and plates—Transverse vibrations of fixed and free rods—Inharmonic upper partials—The kaleidophone—The harmonicon—The tuning fork—Vibration of plates—Nodal lines—Chladni's figures—Vibration of bells.

Longitudinal vibration of strings and fixed and free rods—Determination of the velocity of sound in solids—Marloye's harp.

The organ of voice—Vowel and consonantal sounds—Analysis and synthesis of vowel sounds—Speaking machines—The Phonograph.

The organ of hearing—The structure of the ear—The labyrinth—The semicircular canals and their probable function—The cochlea—The membrana basilaris and Corti's arches: their probable function—Sympathetic vibrations.

Beats—The interference of two simple tones—Effect of difference of phase—Optical representation of beats—Limit of audible beats. This limit depends on two causes: (*a*) number of beats per second, (*b*) magnitude of the interval—Origin of dissonance.

Musical tones and their production—Tones and semitones—Simple and compound tones—Partial tones—Composition and resolution of compound musical tones—Optical methods of investigating sonorous vibrations—Cause of various qualities of musical tones found in the greater or less abundance of harmonic and inharmonic upper partials—Harmonic upper partials of a string—Force of upper partials dependent on *how* the string is struck, *where* it is struck, and the *character of the string*—The pianoforte—The violin—Helmholtz's vibration microscope.

Musical Intervals—Consonant and dissonant intervals—Temperament—Optical representation of intervals—Lissajous' figures.

Combination tones.—The so-called Tartini's tones or grave harmonic—The cause of these tones—The classes of combination or resultant tones—Differential tones and summational tones.

LIGHT.

Photometry—Wheatstone's, Joly's, and Lummer and Brodhun's photometers—Standard of light.

Camera lucida—Optical instruments—The eye—Binocular vision—Cause of single vision—The reflecting and refracting stereoscope—*Defects* of the eye:—Astigmatism—Chromatic aberration—Colour-blindness—Muscæ volatantes—Blind spot—Irradiation—Persistence of impressions—Thaumatrope—Phenakistiscope—Fatigue of eye—Accidental or subjective images.

Colour—The prismatic and the normal spectrum—Irrationality of dispersion—Dichroism—Doctrine of colours—Young and Helmholtz's theory—Colour mixture—Maxwell's and Abney's researches.

Velocity of Light—Foucault's, Fizeau's, and Cornu's methods—Recent determinations of the velocity—Michelson's experiments—Velocity through various media—Relative motion of matter and ether.

Theories of Light—The corpuscular and the wave theory—Principle of Huyghens. Compounding of vibrations.

Refraction of Light—Effect of temperature on index of refraction—Dr. Gladstone's researches—Specific refractive energy—Total reflection—Limiting angle—Atmospheric refraction—Mirage—Looming—The Rainbow.

Interference of light—Newton's rings—Colours of thin films—Explanation of these colours—Change of phase of wave—Determination of wave lengths—Fresnel's mirrors and bi-prism—*Diffraction*: (*a*) by edge of obstacle, (*b*) by narrow obstacle, (*c*) by narrow aperture—Colours of small particles and of grooved surfaces—Halos and parhelia—Optical bench—Measurement of wave lengths by diffraction gratings.

Polarization of light—Double refraction—Its explanation—Ordinary and extraordinary ray—Crystallographic or optic axis—Biaxial crystals—Double image prism—Nicol's prism—Plane polarized light—Polarization by the tourmaline—Polarization by reflection and by ordinary refraction—Polarizing angle—Brewster's law—Polarization by fine particles—Polarization of clouds and sky—Polar clock—Polariscope—Chromatic effects of polarized light—Effects of temperature, strain, and pressure on transparent media as revealed by polarized light—Origin of rings in uniaxial and biaxial crystals—Arragonite and quartz—Circular polarization—Rotatory power of liquids—Saccharimeters—Magneto-optic rotation.

RADIATION.

Radiation in its chemical aspect.—The communication of molecular motion to the luminiferous ether—Chemical reactions produced by radiation—Vegetation—Photography—Abney's researches—Ultra-violet rays—Fluorescence—The Conversion of non-luminous into luminous radiation Calorescence.

Radiation in its thermal aspect.—Detection and measurement of obscure radiation—Thermo-electric pile—Radio-micrometer—Bolometer—Distribution of heat-bearing rays in the prismatic spectrum—Draper's law of the distribution of energy in the spectrum—Identity of laws relating to luminous and thermal radiation—Radiation in vacuo—Law of inverse squares—reflection, refraction, and polarization of so-called radiant heat—Forbes' experiments on internal radiation—Prevost's theory of exchanges—Stewart's enlargement of this theory—Equilibrium of heat rays—Velocity of cooling—Dulong and Petit's and Stoney's researches.

Absorption of thermal radiation by solids and liquids—Melloni's experiments—Selective absorption—Thermocrosis—Influence of sifting of rays—Influence of temperature of source on penetrating power—Ratio of luminous to obscure radiation from various sources—Radiation from different sources—Reciprocity of absorptive and emissive power—Practical consequences of radiation and absorption—Dew and hoar frost—Diathermancy of *gases* and *vapours*—Tyndall's researches—Transcalency of elementary gases—Effect of aqueous vapour on climate.

Radiation in its luminous aspect—Analysis of the radiation from glowing solids and liquids and from gases and vapours—Continuous and discontinuous

spectra—Spectrum of incandescent coke-points and of voltaic arc—Reciprocity of radiation and absorption—Dr. Stewart's investigation—The solar spectrum—Fraunhofer's lines—Kirchhoff's law.

Spectrum analysis.—The spectroscope—Application to chemical analysis—Application to sunlight and starlight—Solar physics—Huggins and Lockyer's researches—Change of refrangibility due to rapid motion in line of sight—The motion of the fixed stars—Broadening of lines in spectrum—Spectrum of sun spots and of solar flames—Spectrum of corona and of comets—Diffraction spectroscope.

Radiation in its electrical aspect.—Relation of the luminiferous ether to electricity—Hertz's researches—Oscillatory electric discharges—Electro-magnetic radiation—Wave length of electric undulation—Reflection, refraction, and interference of electric radiation—Lodge's, Fitzgerald's, and Marconi's experiments—Wireless Telegraphy.

The Röntgen or X-rays, their production, detection, and application—Crooke's, Lenard's, Röntgen's, and Becquerel's experiments.

MAGNETISM.

Magnetic measurement—i. Method of oscillation—ii. Method of deflection—Method of compensation—iii. Method of torsion—The torsion balance—Coulomb's investigations—Magnetic field—Uniform and variable fields.

Terrestrial magnetism—Isogonic, isoclinic and isodynamic lines— Similarity of isoclinic and isothermal lines on the earth's surface—Variations of magnetic elements.—Magnetometers—Regular and irregular variations—Diurnal, annual, and secular variation—Magnetic perturbations and magnetic storms—Periodicity of these storms, and their relationship to maximum sun-spot periods—Points of contact between these phenomena and auroral displays, tropical rain-fall, &c.

Magnetization of iron ships—Local attraction—Transient, permanent, and sub-permanent magnetism—Means of correcting local attraction.

Molecular effects of magnetization—Ancient and modern hypotheses of magnetism—Ampère's theory—Magnetization a molecular act—Molecular changes accompanying magnetization—Emission of sound—Elongation of iron by magnetization—Grove's experiment—Effect of temperature on magnets and magnetic metals—Gore's experiments—Critical temperature of magnetic metals—Recalescence—Relationship of magnetic metals.

Dia-magnetism—Behaviour of crystals—Plucker's and Tyndall's researches—Magnecrystallic action—Polarity of dia-magnetic force.

Effect of a magnetic field on light.—The so-called "Magnetization of light"—Kerr's discovery—Rotation of the plane of polarization by reflection from a magnetic pole—The Zeeman effect—Preston's experiments.

ELECTRICITY.

ELECTROSTATIC PHENOMENA.—Holtz, Voss, and Wilmshurst influence machines — Hydro-electric machines.

Atmospheric Electricity.—Lodge's experiments — Lightning and Thunder—Return shock—Lightning conductors—Methods and results of investigating atmospheric electricity—Annual and diurnal variations—Possible cause or causes of atmospheric electricity.

ELECTRICAL MEASUREMENTS.— C. G. S. system of units. Ratio of electro-static to electro-magnetic units—Absolute measurement of current strength, and difference of potentian—Quadrant and absolute electrometers—*Galvanometers*—D'Arsonval and other dead-beat galvanometers—Ballistic galvanometers—Ampère meters and volt-meters—Cardew's volt-meter—Kelvin's standard balance and other electro-dynamometers—Watt-meters.

Electro-thermal action.—Joule's Law—Relation of heat in circuit to chemical action in cell, and work done by current—Favre's experiments—Calculation of electro-motive force of cell in terms of heat of combination—Electro-motive force generated in the arc—Measurement of the efficiency of electric lights.

Thermo-electricity.—Thermo-electric diagram—Thermo-electric pile battery and pyrometer—Tait's researches—Evolution and absorption of heat at thermo-electric junctions—The Peltier effect—Thermo-electric inversion—Neutral point—The Thomson effect.

Production of a magnetic field by a current.—Electro-magnets—Laws of Electro-magnetism—Magnetic permeability—Hysteresis—Ewing's and Hopkinson's researches—Measurement of magnetic field and magnetic induction of metals—Magnetometric and Ballistic methods—Permeability bridge.

Electro-magnetic induction—Currents induced in closed circuits by a neighbouring current:—i., by commencement or cessation of primary current; ii., by its approach or recession; iii., by its variation of strength; iv., by approach or recession of a magnet; v., by variation in magnetic strength; vi., by terrestrial magnetism—Relation of induced currents to lines of force and work done—Lenz's law—Arago's rotations—Copper dampers—Eddy currents—Heat developed by rotation of conductor in magnetic field—Self-induction—Effects of inductance—Extra current—Electro-magnetic inertia—Induction coil—Function of the condenser—Discharge in rarefied gases—Practical application of induction in electric distribution through towns—Transformers.

Applications of electro-magnetism.—Magneto-electric machines — Siemens' armature — Wilde's machine — Dynamo machines—Alternate current machines—Electric motors—Estimate of their efficiency—Comparative economy of electro-motors and other engines—Electric traction—*Transmission of intelligence by electricity*—Hughes' printing telegraph—Wheatstone's automatic system—Speed of signalling—Leakage—Relay—Siemens' Polarized Relay—Systems of duplex telegraphy—Experimental illustration of the duplex system in general use—Quadruplex telegraphy—Reis', Bell's, and Edison's Telephone—Submarine telegraphy—Retardation by induction—Capacity of cables—Submarine contact key—Siphon-recorder—Velocity of transmission in cables—Nature of "faults" in cables.

Text-book:—Barker's or Peddie's Physics; Brown's Problems in Physics, Part 2.

Students are also expected to consult Jamin's Cour de Physique; Preston's Light and Heat, and Tait's Properties of Matter, &c.

THIRD YEAR.

A Course of about thirty tutorial classes in the first and second terms.

This Course includes the study of the higher branches of Experimental and Applied Physics, more especially in Magnetism and Electricity, and embraces electrical testing, absolute magnetic, and electrical measurements, electric telephony, electric lighting, electrical transmission of power, &c., &c. Advanced work in the Physical Laboratory accompanies the Tutorial Lectures, and is arranged so as to suit the requirements of those who intend to become Electrical Engineers. (See p. 58.)

Text-Book.—Jamin et Bouty Cours de Physique.

Students are also expected to consult *Thompson's Dynamo-Electric Mac[illegible]ing's Magnetic Induction in Iron; Fleming's Alternate Current Transformer; Knapp's Transmission of Energy.*

PHYSICAL LABORATORY.

For Non-Associate Students the complete course of laboratory work in Experimental Physics is divided into sections. As a rule students are required systematically to take up these divisions after having attended, or whilst attending, the course of lectures on Physics during the session. Any student whose previous knowledge or future career renders it advisable for him to select and extend one branch, can do so under certain conditions. This especially applies to Electrical Engineers, Candidates for the Royal University, the Medical and Army Examinations, the Home and India Civil Service. Opportunities are also afforded for original work, and for special lines of inquiry by advanced students.

The preliminary part of the practical course is designed to give all students facility in physical manipulation, in exact and systematic observation, and in the recording and graphic representation of results.

FIRST YEAR.

SECTION I.

PHYSICAL PROCESSES AND MEASUREMENTS, PROPERTIES OF MATTER.

Space measurements.—Verniers, straight and circular Beam compass, calipers. Micrometer screw. Spherometer. Cathetometer. Barometer reading. Angular measurements. The sextant. Measurement of areas and volmues. Graphic representation of results. Construction of a millimetre scale.

Mass measurement.—The Balance. Methods of accurate weighing. Specific gravity of (1) Solids:—insoluble, soluble, and powders. (2) Liquids:—Nicholson's and other hydrometers and densimeters.

Time measurements.—Measurement of small intervals of time. Laws of the simple pendulum. Determination of the value of "*g*" by the simple pendulum.

PROPERTIES OF MATTER.—*Solids*:—Determination of Young's modulus of elasticity for stretching. Tenacity, Centre of percussion. Laws of torsional vibration. *Fluids*:—Pressure of the atmosphere, pressure of liquids at various depths. Laws of the flow of liquids. Boyle's law. Construction of a barometer. Measurement of heights by barometer.

SECTION II.

HEAT.

Thermometry.—Testing thermometers. Maximum and minimum thermometers. Rate of cooling. Graphic representation of results. Boiling points. Fusing points.

Expansion.—Measurement of the linear coefficient of expansion of solids. Measurement of the real and apparent expansion of liquids.

Calorimetry.—Determination of the specific heat of solids by the method of mixtures and the method of fusion. Specific heat of liquids by the method of mixtures and by the method of cooling. Determination of the latent heat of ice and steam.

Hygrometry.—Measurement of the vapour pressure of water at different temperatures. Maximum pressure of various liquids at the temperature of the air. Dew point. Use of Daniell's and Mason's hygrometers.

SECTION III.

SOUND.

Vibration.—Measurement of the vibration number of different musical notes by the siren. Determination of the wave-length and the velocity of sound in air by resonance and by interference. Laws of the transverse vibration of strings, the monochord. Composition of vibrations; Blackburn's pendulum.

SECTION IV.

LIGHT.

Photometry.—Determination of the illuminating power of various sources of light by means of Rumford's, Bunsen's and Joly's photometers.

Reflection.—Determination of the laws of reflection, measurement of the focal lengths of concave and convex mirrors, both optically and by the spherometer.

Refraction.—Determination of the focal lengths of lenses. The microscope and telescope. Magnifying powers. Measurement of the angles, prisms, and index of refraction of solids by the spectrometer. Measurement of the dispersive power.

SECTION V.

MAGNETISM AND ELECTRICITY.

Magnetism.—The making of magnets. Magnetic curves. Magnetic Fields and their exploration. Measurement of the magnetic force at different distances. Determination of the magnetic moment and the intensity of magnetization of bar magnets. Solenoidal and electro-magnets. Use of the dipping needle. Determination of the magnetic dip.

Static Electricity.—Construction and use of gold-leaf electroscope. Construction and electrical examination of the electrophorus and Leyden jar. Examination of frictional and induction electric machines.

Current Electricity.—Construction and charging different Voltaic or primary cells. Secondary or storage cells. Measurement of the electro-motive force of cells. Use and construction of Tangent, Astatic, Mirror, Graded, Magnetostatic, and Dead-beat galvanometers. Experimental proof of Ohm's Law. Measurement of the resistance of wires. Wheatstone's bridge:—the Metre-bridge and Post-office forms. Rheostat. Determination of the resistance of galvanometers, and of voltaic cells by different methods. The electrolysis of water and of salts. Electrotyping. Construction and joining up of electric bells and electric telephones. Examination and joining up of various forms of electric telegraph.

SECOND YEAR.

Students take the parts appropriate to their different faculties as directed.

SECTION I.

GENERAL PHYSICS.

Measurement of minute changes of length by the optical lever. Dividing engine—graduation of a burette. The Planimeter. Specific gravity by the stereometer. Determination of the density of gases.

The compound pendulum. Kater's pendulum. The Ballistic pendulum. Atwood's machine, and the determination of the laws of falling bodies. Young's modulus for flexure. Modulus of torsion. Rigidity. Poisson's ratio. Longitudinal and torsional resilience. Moment of inertia. Brake horse-power.

The compressibility of liquids. The piezometer. The Sprengel pump. M'Leod gauge.

Diffusion. Capillarity. Determination of the capillary constants of various liquids. Measurement of surface tension and the coefficiency of viscosity of different liquids.

SECTION II.

HEAT.

Measurement of the volume expansion of solids and liquids. The weight thermometer. Coefficient of expansion of cases under constant pressure and under constant volume. The air thermometer.

The specific heat of gases. Measurement of the latent heat of fusion and of vaporisation of different solids and liquids. Joly's calorimeter. Use of Dine's, Regnault's, and the chemical hygrometer. Measurement of mechanical equivalent of heat.

Conductivity and emissivity. Measurement of the conductivity of solids. Determination of the radiation and absorption of solids and liquids by the thermo-electric pile. Determination of high temperatures by different forms of pyrometer.

SECTION III.

SOUND.

Vibration of plates and bells. Chladni's figures. Manipulation of manometric, singing, and sensitive flames.

Measurement of the velocity of sound in solids and liquids by longitudinal vibrations. Measurement of wave lengths:—(1) By sensitive flames. (2) By dust figures. Reflection and refraction of waves. Interference of waves.

Musical intervals. The combination of vibrations. Helmholtz's double siren. Lissajou's figures. The structure of the ear and the organ of voice.

SECTION IV.

LIGHT.

Standard sources of light. Determination of illuminating power by Lummer and Brodhun's photometer. Measurement of the index of refraction of solids and liquids—(1) by the spectrometer; (2) by the microscope; (3) by the hollow lens.

Spectrum analysis. Plotting reference curves of wave-lengths. The spectrum of gases. Measurement of the position of the chief Fraunhofer lines. The normal spectrum by means of plane and concave diffraction gratings.

Determination of the wave-length of monochromatic light (1) by a narrow slit, (2) by Fresnel's mirrors, (3) by the bi-prism, (4) Newton's rings, (5) by diffraction gratings.

Measurement of the angle of polarization in different solids. Brewster's law. Determination of the index of refraction of opaque solids. Experiments on plane and circularly polarized light. Rotatory polarization of liquids. The Saccharimeter. Determination of the percentage of sugar in solution. Rotation of polarized ray in magnetic field.

SECTION V.

MAGNETISM AND ELECTRICITY.

Measurement of the effect of heat on the magnetic moment of bar magnets. Determination of the magnetic dip by the earth-inductor. Determination of the variation of the compass-needle. The Azimuth compass. Determination of the horizontal and vertical components of the Earth's magnetic force in C. G. S. units.

Use of the Quadrant Electrometer. The comparison of the capacities of condensers.

The Dial bridge. Determination of temperature coefficients.

Measurement of very high and very low resistances. Determination of the specific resistance of solids and liquids. Reduction factor of galvanometer. Joule's law.

Laws of electrolysis, and use of copper, silver, and water voltameters.

Practical applications of Electricity.—Electro-metallurgy. Practical measuring instruments. Telegraphy and Telephony. The Relay. Dynamos.

THIRD YEAR.

Electricity and Magnetism.

Absolute Measurements.

The use of the Quadrant, Absolute, and Multicellular electrometers. Measurement of the capacity of condensers and Leyden jars in absolute measure. Specific inductive capacity.

Electro-dynamometers. Lord Kelvin's standard balance.

Electro-magnetic induction. The Earth inductor. Measurement of the strength of magnetic fields.

Determination of the permeability and of the susceptibility of magnetic metals (1) by the ring or ballistic method, (2) the magnetometer method, (3) Ewing's Yoke, (4) Ewing's Permeability bridge.

Determination of the coefficients of self-induction and mutual induction in absolute measure.

Electro-Technics.

Electric Testing.—Use of Ohmmeters, Wattmeters, electric balances, electro-static voltmeters, hot wire instruments. The Silvertown and Lord Kelvin's testing set. Testing of telegraph lines and cables for conduction, insulation, and capacity, and for faults.

Storage Cells; different types; rate of charge and discharge; arrangement and efficiency of secondary cells.

Electric Lighting.—Arc and glow lamps; arrangement of circuits. Illuminating power and efficiency of lamps.

Dynamos and Motors.—Series and shunt direct current machines. Measurement of their mechanical and electrical efficiency. Characteristic and horse-power curves. Boosters.

Alternators.—Single and polyphase generators and motors. Winding, efficiency, &c. Arrangement of lamps, &c., in polyphase circuits.

Electric transmission of power.—Transformers. Rotatory converters. Choking coils. Supply meters.

Electric-signalling.—Systems of high-speed, quadruplex, multiplex, and type-printing telegraphs. Telephony, exchange switch-board. Electric waves. Wireless telegraphy.

Rontgen Rays.—Cathode and Rontgen ray tubes. Radiography. Surgical and mineralogical applications.

Electro-chemistry and Electro-metallurgy.—Electro-plating. Preparation of copper, silvering, gilding, and nickelling solutions. Methods of deposition. Effect of current density. Depositing brass and other alloys. Electrolytic production of caustic soda, white lead, &c. The Castner-Kellner and the Bischof processes. Electric furnace. Production of aluminium, calcium-carbide and carborundum, &c. Electric welding.

Each student on entering the physical laboratory must provide himself with a pair of scissors, a triangular file, a foot rule divided into millimetres and inches, a box of gramme weights, and a centigrade thermometer from 0 to 100° C. These can be obtained at the cost of about fifteen shillings. Each student is provided with a suitable working bench, fitted with cupboard, drawers, &c., and supplied with gas, battery-power, and such chemicals as may be needed, free of expense. Every student has also the use of the extensive collection of physical apparatus belonging to the College; but he is held responsible for the safety of any article under his charge, and must make good any damage he does, other than legitimate wear and tear. Apparatus made by students in the laboratory becomes their own property, if the raw material has been provided at their own cost.

Text Book.—Barrett and Brown's Practical Physics, part 1; also Glazebrook and Shaw's Practical Physics.

Junior Students will find it useful to consult Ayrton's Practical Electricity and Nichol's Laboratory Manual of Physics, vol. 1.

Senior Students must consult Nichol's Laboratory Manual, vol. 2, advanced course, and Kohlrausch's Physical Measurements. These books are in the Library of the College.

SYLLABUS.

CHEMISTRY.

Professor W. N. HARTLEY, F.R.S., F.C.S., F.R.S.E.
Assistant Chemist, J. HOLMS POLLOK, B.Sc.
Demonstrator for Chemistry and Assaying, A. E. B. MANDERS.

First Term:—October till February—General Chemistry.

Second Term:—February till June—Advanced Course of Chemistry.

The syllabus of the advanced course is subject to slight variation owing to the nature of the subject and the requirements of students attending this course.

1. General Chemistry.

A course of about 45 experimental lectures on general chemistry.

2. Advanced Course of Chemistry.

A course of about 45 lectures on organic chemistry.

3. Practical and Analytical Chemistry.

A laboratory course of practical work, including—

(*a.*) Simple experimental operations.
(*b.*) The preparation of elements and compounds.
(*c.*) Qualitative analysis.
(*d.*) Quantitative analysis.
(*e.*) Assaying.
(*f.*) Instruction in chemical research.

Occasional students may attend one or more courses as they may desire, but it is necessary that they should acquire some knowledge of theoretical chemistry before entering upon a course of analytical chemistry.

1. GENERAL CHEMISTRY.

Chemical Philosophy.

Chemistry, its origin as an art, and its development into a science. Common objects, great in variety, are capable of transformation. Of matter or that which occupies space. Of volume or bulk of matter. Of mass and of weight. Chemical change. Metric system of weights and measures. Of weighing. Specific weight of different substances. Of energy. Difference between heat and temperature. Units of heat. Specific heat. The constitution of matter. Elementary and compound matter. Properties of gases. The weight of air. The effect of temperature on gases. The law of Gay Lussac and of Charles. Effect of pressure upon gases. Boyle's law. Dalton's law of partial pressures. The liquefaction of gases. The density of gases. The diffusion of gases. Graham's law. Indestructibility of matter. Physical and chemical changes. Analysis and synthesis. Varieties of chemical change. Laws of chemical combination. Berthollet's law. Dalton's law. Dalton's hypothesis. Chemical equivalents or equivalent weights. Electro-chemical equivalents. Gay Lussac's law and Avogadro's hypothesis. Cavendish's experiment on the synthesis of water. The electrolysis of water. Atomic mass, commonly called atomic weight. Definition of atomic mass. Dulong and Petit's law. Vapour densities. Hoffman's synthesis of water. Of symbols and their uses. Formulæ and equations. The principles of chemical nomenclature. Of valency or quantivalence. The periodic law of the elements.

Inorganic Chemistry.

Hydrogen.—Occurrence on the earth, in the sun and other celestial bodies. Preparation from water and acids. Its properties, physical and chemical. So-called nascent hydrogen. Reducing power of hydrogen.

Fluorine.—The properties of fluorine. Fluorspar and cryolite sources of fluorine. Preparation of hydrofluoric acid from fluorides. Properties of hydrofluoric acid. Uses of the solution and of the gas. Isolation of fluorine from anhydrous hydrofluoric acid.

Chlorine.—Salt, the source of chlorine. Preparation of hydrochloric acid from salt. Preparation of chlorine by the oxidation of hydrochloric acid. Properties of chlorine. Its combination with non-metals and metals. Its action on turpentine, coal-gas, and ammonia.

Hydrochloric Acid.—Its preparation and properties. Composition of hydrochloric acid. Its solution in water. Its action on metals, metallic oxides, and carbonates. Chlorides. Bleaching powder and oxygen. Compounds of chlorine.

Bromine.—Its preparation and properties. Hydrobromic acid. Bromides.

Iodine.—Its sources. Kelp. Preparation from kelp and from sea-weed. Its properties. Solubility in different substances. Tests for iodine. Hydriodic acid, its instability. Iodides and their uses.

Oxygen.—Discovery of oxygen and the nature of air. Preparation of oxygen from various oxides. Combustion of non-metallic and metallic substances in oxygen. Production of oxides. Difference in character of oxides. Heat evolved by combustion in oxygen. The lime-light and oxyhydrogen blow-pipe.

Ozone.—Allotropic oxygen. Its production by electrification, slow oxidation, and by combustion. The nature of ozone. Its properties and chemical reactions. Its occurrence in the atmosphere. Its blue colour. Tests for ozone. Soret's experiments on the constitution of ozone. Ladenburg's determination of the density of ozone.

Water.—Decomposition of water by heat and by electrolysis. Synthesis of water by weight, by Boussingault and by Dumas and Stas. Determination of atomic weights of hydrogen and oxygen, by Morley, Scott, and others. Solution of gases in water. Of natural water and the mineral matter dissolved therein. Hard and soft waters.

Combinations of Water.—Water of crystallization. The slaking of lime. The setting of plaster. Anhydrous and hydrated salts. Efflorescence and deliquescence. Cobalt iodide and its properties. Heat of mixture of water and oil of vitriol. Freezing mixtures. Supersaturated solutions. Crystallization.

Hydrogen Peroxide.—Preparation of barium peroxide and of hydrogen peroxide. Its properties, uses, and remarkable reactions.

Sulphur.—Its occurrence in nature. Native Sulphides. Allotropy. Octahedral, prismatic, and plastic sulphur, how prepared. Their properties. The sulphuration of metals. Preparation of ferrous sulphide.

Sulphuretted Hydrogen.—Preparation and properties. Its use in chemical analysis.

Sulphur dioxide.—Methods of preparation. Its properties. Its solution in water. Its liquefaction. Its uses. Its oxidation to sulphur trioxide. Sulphurous acid and sulphites. Schützenberger's hyposulphites.

Sulphur Trioxide.—Properties and uses of sulphur trioxide. Its manufacture.

Sulphuric Acid.—General description of the process of making sulphuric acid. The chemistry of the chamber process. Recovery of the nitrogen compounds. Description of the Gay Lussac tower, and its use. Description of the Glover tower, and its uses. Advantages of working sulphuric acid chambers with the Glover tower. The concentration of sulphuric acid in lead, glass, and platinum vessels. The manufacture of Nordhausen acid, and of sulphuric anhydride. Reactions of sulphuric acid.

Selenium and Tellurium.—Compounds of these elements closely analogous to sulphur compounds.

Nitrogen.—Its occurrence and its inert character. Energetic nature of the compounds of nitrogen as ammonia and nitric acid. *Air.*—Composition of air by volume and by weight. The analysis of air. The combustible gases of the atmosphere.

Argon.—A constituent of air. Its discovery owing to its density, and its spectrum. Its identification as an element.

Helium.—Discovery of this element in the spectrum of the sun. Its discovery in terrestrial matter, in minerals, and in association with argon in the gases from mineral waters. The peculiar properties of argon and helium. The argon group of elements.

Ammonia.—Its preparation from nitrogenous organic matter and ammonia salts, and by the distillation of coal. Its composition. Action of heat on combustibility of. Its solubility in water. Solution of ammonia and its uses. Combination of ammonia and acids. Hypothetical metal ammonium and its salts. Metallic ammoniums. Nessler's reaction. Oxidation of ammonia. Production of ammonia from nitrates.

Nitric Acid.—Sources of nitrates. Preparation of nitric acid. Decomposition of nitric acid by heat. Action on organic matter and combustibles. Action on metals. Formation of nitrates. Constitution of nitric acid. Nitrates.

Dissociation.—Tension of dissociation. Examples of dissociation.

The Oxides of Nitrogen.—Their composition, preparation, uses, and properties.

Phosphorus.—Natural phosphates and calcined bones, the sources of phosphorus. Preparation and properties of phosphorus. Waxy and red phosphorus—their difference in properties. Uses. Means of detecting phosphorus. Precipitation of metals by.

Phosphoretted Hydrogen.—Three compounds of phosphorus and hydrogen. Preparation of the gaseous compound. Its feebly basic properties.

Phosphorus Trichloride and Pentachloride.—How prepared. Their properties and reactions with water. Action of heat on pentachloride.

Phosphorus Oxide and Phosphoric Oxide.—Their formation. Mode of preparation of phosphoric anhydride. Formula of the substance. Its properties. Phosphites and phosphates. Hypophosphites.

The three phosphoric acids.—Action of water on the oxides of phosphorus. Formation of ortho, pyro, and meta, phosphoric acids. Their constitution. Constitution of various phosphates. Reactions of phosphates. Phosphates as fertilisers.

Arsenic.—Minerals containing arsenic. Preparation of arsenic. Its properties. The poisonous properties of its compounds. Arseniuretted hydrogen. Reinsch's and Marsh's tests for arsenic. Arsenious oxide and arsenic anhydride. Formulæ of these oxides. Arsenic acid and arseniates.

Antimony.—Minerals containing antimony. Reduction of antimony from stibnite. Refining of antimony. The properties of antimony. Alloys as pewter and type-metal. Stibine or antimonuretted hydrogen. Marsh's and Reinsch's tests for antimony. How distinguished from arsenic. The chlorides of antimony. Oxides and sulphide of antimony. Tartar emetic.

Bismuth.—Native bismuth. Extraction of bismuth from its ores. Bismuth terchloride, oxychloride. The oxides of bismuth. Salts of bismuth. Wood's fusible alloy.

Boron.—Minerals containing boron. Occurrence of boracic acid. Preparation of boron, amorphous and adamantine. Hydrogen boride. Its preparation and properties. Extraction of boracic acid from lagoons. Its characteristic properties. Its uses as an antiseptic. Borax and derived borates. Their composition and constitution. Uses of various borates.

Silicon.—Examples of silica in various forms. Silicates. The preparation of amorphous and adamantine silicon. Silicon hydride and its preparation. Analysis and properties. Soluble silica—its preparation and properties. Silicic anhydride. Condensed acids of silicon. Classification of silicates. Glass, a mixture of silicates. Influence of the bases on the properties of glass. Soluble glass. Clay, slags, pottery, porcelain, and enamels. Glass-wool, and kieselguhr. Hydraulic cements. Silicon fluoride and silico-fluoric acid.

Carbon.—Its occurrence in petroleum, marsh-gas, and various forms of coal. As plumbago or praghite, and as diamond. The properties of the three allotropic carbons. The uses of charcoal, animal charcoal, plumbago, boart, carbonado, and diamond. Determination of atomic weight of carbon.

Methane or marsh-gas.—*Its* composition, natural occurrence, preparation, and properties. Substitution of hydrogen in methane by chlorine. Fire-damp. The safety-lamp. The nature and structure of flame.

Carbon Dioxide.—Production in various ways. Its reduction to carbon. Its properties. Its occurrence in the atmosphere. Its liquefaction and solidification. Natural occurrence of liquid carbon dioxide in minerals. Its commercial uses and manufacture. The solution of carbon dioxide in water. Carbonic acid and carbonates. Constitution of various carbonates.

Carbon Monoxide.—Its preparation and properties. Its poisonous character. Reduction of carbon dioxide to the monoxide. Its production in furnaces. Its uses as a reducing agent in metallurgy. Its combustion to carbon dioxide.

Carbon Disulphide.—Its preparation, properties, and uses.

Cyanogen.—The preparation of cyanides and ferrocyanides. The preparation of cyanogen from mercuric cyanide. Properties of cyanogen.

Hydrocyanic Acid.—Its preparation. The anhydrous acid. The solution in water. Its poisonous properties. Its use in medicine. Tests for hydrocyanic acid. Its conversion into methylamine by nascent hydrogen. Its conversion into formic acid and ammonia by hydrochloric acid.

Cyanides, cyanates, sulphocyanates, ferrocyanides, and ferrocyanides. Prussian blue.

Metallic Carbides.—Discovery of metallic carbides. Barium and Calcium carbides. Their preparation and uses. Ferrous and manganese carbides. Acetylene and its industrial applications.

Silicon Carbide.—Its composition, properties, and preparation.

General consideration of Metallic Elements.—The characteristics of the chief groups of metals. The periodic law. The spectra of metals. The discovery of rare metals. Nature of metallic ores. Their treatment for the extraction of metals. The blast furnace. The reverberatory furnace. Furnace re-actions.

ADVANCED COURSE OF CHEMISTRY.

PART I.

The Chemistry of Carbon Compounds.

Characteristics of carbon and its combinations. The analysis of carbon compounds. Determination of carbon, hydrogen, and nitrogen. Purification of organic substances by fractional distillation and by crystallization. Determination of boiling point, melting point, vapour density, and optical properties. Rotation of ray of polarised light. Absorption spectra of organic substances. Specific refractive energy. Relation between the physical properties and chemical constitution of organic substances. Variations in flavour, odour, and colour of organic substances. Homologous series. Compound radicals. Composition of molecules. Valency of compound radicals. Saturated and non-saturated compounds. Isomerism, metamerism, polymerism, and tautomerism. Condensed molecules. Empirical, rational, and constitutional formulæ. Classification of organic compounds—characters of the principal groups. Chemical action of halogens, oxygen, and various energetic compounds on organic substances. Action of heat on organic compounds. Fermentation, putrefaction, and decay.

Derivatives of the Homologous Series $C_n H_{2n-2}$ *called the Paraffins.*—The derived alcohols, ethers, acids, aldehydes and amines. The preparation of organic substances illustrated by the distillation of wood and the preparation of pure methylic alcohol from the wood naphtha. Conversion of crude into pure methylic alcohol. Sources of methylic alcohol. Preparation of methylic chloride, methylic iodide, sodium, methylate, methyl sulphuric acid, methylic acetate, formic aldehyde, and formic acid. Preparation of methane, and of chloroform.

Ethylic alcohol. Its preparation synthetically from coal-gas, and from saccharine solutions by fermentation. Fermentation and distillation. The object of fermentation is the production of alcohol or of alcoholic products. The uses of alcohol in manufactures. The sources of alcohol. Technical processes necessary for the production of alcohol. Grain and potato spirit.

Buchner's recent researches on fermentation.

Alcohol produced by mould. Its existence in rain water, river, and sea water. Its presence in the soil. Its absence from deep spring water. The process whereby alcohol is separated from water. The simplest form of distillation by a still and worm. The boiling points of water and alcohol. Boiling of mixtures with low boiling points by means of vapours of liquids with high boiling points. Pot stills and patent stills. Laugier's still. The principle of Coffey's still. Its mode of action described. Savalle's still. Of alcoholic beverages and other products.

Preparation of pure anhydrous alcohol. The etherification of alcohol. Ether and its properties. Preparation of ethylic acetate, and other ethereal salts. Sodium ethylate, or sodium-alcohol. Preparation of aldehyde and aldehyde ammonia—its properties. Preparation of acetic acid from wood. Vinegar. Acetates.

Acetyl and its derivatives. Preparation of acetyl chloride. Glacial acetic acid.

Organo-metallic compounds, illustrated by zinc-ethyl and its preparation. Properties of zinc-ethyl.

Amines, illustrated by ethylamine, di-ethylamine, and triethylamine. Their mode of preparation, and their properties.

The Series $C_n H_{2n}$ *or Olefines.*—Preparation of ethene or ethylene. Its properties. Its combinations with chlorine, bromine, and iodine.

Ethene hydroxide, or glycol, a di-hydric alcohol. The characteristics and mode of formation of glycol.

Ethene oxide. Its properties. Neurine or choline. Oxalic acid. Oxalates. Glyoxalic acid. Glyoxal. Glycollic acid. The relation of these substances to alcohol.

The Series $C_n H_{2n-2}$.—Preparation of acetylene from the direct union of hydrogen and carbon, and from calcium carbide by the action of water. Preparation of acetylene from coal-gas, and by the incomplete combustion of hydrocarbons. Cuprous acetylide and its properties. Argentous acetylide.

Oils and Fats.—Difference between essential oils and fatty oils. Drying oils and non-drying oils. The process of saponification. Of various soaps.

Glycerine, a trihydric alcohol.

Constitution of oils and fats. Commercial uses of glycerine. Chlorhydrins. Glycero-sulphuric and glycero-phosphoric acids.

Decomposition of glycerine by heat.

Ethereal salts of glycerine. Tri-nitrin and dynamite. Tri-palmitin, or palm oil. Tri-stearin, or mutton fat, and tri-butyrin, or butter.

Acrolein. Acrylic acid.

The Carbohydrates.—Definition of the carbohydrates. Their general characters.

The glucose, saccharose, and amylose groups. Hydrolysis. Reduction of starch to glucose. Diastatic ferments, or natural hydrolytic agents. The properties of starch.

Cane sugar, maltose, or malt sugar, and galactose, or milk sugar. Constitution of sugars. Inversion of cane sugar. Properties of dextrose and levulose.

Methods of estimating sugar.

Cotton. Gun-cotton. Collodions. Paper. Vegetable parchment. Blasting gelatine.

Essential Oils.—The terpenes and citrenes. Their supposed constitution. Physical isomerism. Their optical properties.

Coal-tar and its products.—The production of coal-gas. Separation of ammoniacal liquor and tar. Distillation of tar. Products therefrom.

Products of the distillation of Coal.—The manufacture of illuminating gas. Description of the distilling and purifying apparatus and of the processes of purification. Preparation of ammonia salts from gas-liquor. The distillation of tar. The separation of light and heavy oils. Distillation of anthracene from pitch.

Benzene and its Derivatives; or, the Aromatic Series.

Production of benzene synthetically. The constitution of benzene. Formulæ for benzene, proposed by Kekulé, Ladenburg, and others. Requirements of such a formula. Isomerism in the benzene series. Orientation of replaced hydrogen atoms in benzene. Chemical characters of the benzene nucleus. Substitution compounds of benzene. Addition compounds of benzene. Characteristics of the hydroxyl and carboxyl derivatives of benzene. Benzene sulphonic acid. Phenols. Substituted phenols.

Di-hydroxybenzenes, tri-hydroxybenzenes.

Phenol, or carbolic acid. Its preparation. Its uses and properties. Mono-nitro-phenols.

Tri-nitro-phenol, or picric acid, and its uses.

Combination of phenol, and of trinitro-phenol, with bases Cresols, xylol, thymol.

Pyrocatechol. Resorcinol. Hydroquinol.

Pyrogallol, or pyrogallic acid.

Benzyl alcohol. Oil of bitter almonds, or benzoic aldehyde. Benzolic acid.

Toluic acid. Hydroxybenzoic acids. Preparation of salicylic acid from phenol. Its properties and uses.

Protocatechuic acid. Vanillic acid. Vanillin.

Tri-hydroxybenzoic acids. Gallic acid.

Tannic acid. Benzene dicarboxylic acid, and carboxylic acids. Phthalic, isophthalic, and terephthalic acids.

Amido-benzene. Amido-toluene. Azobenzene.

The synthesis of benzenoid hydrocarbons.

Toluene, its constitution.

Tri-phenyl-methane, and its derivatives.

Aniline dyes. Para-rosaniline. Rosaniline. Their method of manufacture, and properties.

Substituted rosanilines, and their purple, blue, and green derivatives. Intensity of colouring power, independent of depth of tint. Phthaleins. Phenol-

DOCUMENTS, II.

phthalein, and its properties. Resorcin-phthalein, or fluorescein. Eosin. Dyeing properties of eosin.

Cinnyl alcohol, cinnamic aldehyde and cinnamic acid, Coumarin.

Phenyl-acetylene. Phenyl-propiolic acid, or the nitro-phenyl-propiolic acid. Indigo blue. Indigo white. Baeyer's more recent synthesis of indigo.

Condensed Benzenes.—Naphthalene. Anthracene. Phenanthrene.

Azo-benzene, and its derivatives.

The tropæoline dyes, their constitution and colouring properties.

Anthracene, and its derivatives. Anthraquinone. Alizarin and purpurin. Synthesis of Alizarine, by Graebe and Liebermann. Its use as a dye and colour. Alizarine lakes.

PART II.

On the Connection between the Chemical Constitution and Physical Properties of Organic Substances.

Isomerism in the naphthalene derivatives, compared with that in the benzene series, α and β naphthols.

Isomerism in the pyrridine and quinoline derivatives, compared with that in the naphthalene. Pyrridine and quinoline are tertiary bases. Method of describing the isomers.

Stereoisomerism.—The cause of optical rotation in solids, as, for instance, *quartz*; in liquids as the lactic acid and sugar solutions. Le Bel and Van t'Hoff's hypothesis. The asymmetric carbon atom. Simple cases of isomerism in space, as differentiated from isomerism of position or structural isomerism. The lactic acids. Fumaric and maleic acids.

Optical Isomerism.—Optical activity. Active and inactive tartaric acids. The structure and configuration of succinic acid. The acids derived from it. Fumaric and maleic acids. The connection of fumaric with tartaric acids, and of maleic with mesotartaric acid. Acids compensated internally. The inactive lactic acid. Its synthesis from the zinc salts of the dextro and lœvo-rotatory acids. The stereoisomerism of the tartaric acids. Optical activity in certain alkaloids. Explanation of the optical activity of coniine. The constitution of coniine determined both by analysis and synthesis.

Variations in the hydrogen substitution, OH, NH_2, COOH, and I, are equally effective. Production of inactive compounds by heating active derivatives. Substances rendered inactive by compensation. Substances internally compensated.

Tautomerism.—Substances of ascertained constitution exhibit in certain reactions evidence of having a constitution quite different. Reactions which might have been expected to yield isomeric compounds, produce substances really identical in constitution.

The derivatives of nitro compounds and of nitrites; of cyanides and isocyanides; of cyanates and isocyanates; of cyanuric acid and isocyanuric acid derivatives. The possible different constitutional formulæ for cyanogen $(CN)_2$. The constitution of hydrocyanic acid according to Nef is that assigned to isocyanides.

The tautomerism of cyanuric acid. Conrad Laar's view. Von Baeyer's pseudo-forms or tautomeric derivatives. Desmotropy. Brühl's investigation of tautomeric substances by means of measuring their molecular dispersion. Simple cases of isomerism in structure, where the yield of different substances by the action of the same re-agent establishes their constitution, nitroethane and ethylnitrite, their products being ethylamine and alcohol respectively and their constitutions.

$C_2H_5NO_2$ $\quad$ $C_2H_5O-N=O$
$C_2H_5NH_2$ $\quad$ C_2H_5OH.

Oximes and their formation. (*V. Meyer*, 1883.) Substances with a ketonic or aldo form, united with hydroxylamine.

$CH_3\cdot CHO + NH_2OH = CH_3\cdot CH\cdot N\cdot OH + H_2O$
Aldehyde $\quad$ Acetaldoxime.
$(CH_3)_2CO + NH_2OH = (CH_3)_2C\,NOH + H_2O$
Acetone $\quad$ Acetoxime.

Tautomerism in benzaldoximes.

$C_6H_5\cdot CH\cdot N\cdot OH$ formed in crystals M.P. 35°C.

Its conversion into an isomer by dilute hydrochloric acid, M.P. 125° C., which is converted into the original substance by distillation at low pressures.

Proof by its absorption curve, or curve of molecular vibrations, that the two forms are not structurally different. Hence the configuration only can account for the difference.

α form.		β form.	
$C_6H_5\cdot CH$	(M.P. 35°C)	$C_6H_5\cdot CH$	(M.P. 125°C).
$\parallel$		$\parallel$	
$HO\cdot N$		$N\cdot OH$.	
Benz*anti*aldoxime.		Benz*syn*aldoxime.	

Oximes afford examples of substances which were expected to be isomeric proving to be identical in constitution, as, for instance, *nitroso* derivatives and *oximes*.

(1898, *Lapworth, Trans. Chem. Soc., Vol. 73, 445.*)

Method of representing intra-molecular changes. Some of these represented by the general scheme.

$$R_\alpha\cdot R_\beta : R_\gamma \rightleftarrows R_\alpha : R_\beta\cdot R_\gamma$$
$$\quad\quad | \quad\quad\quad\quad\quad\quad | \quad\quad$$
$$\quad M \quad\quad\quad\quad\quad\quad M \quad\quad$$
$$(A_1) \quad\quad\quad\quad\quad\quad (A_2)$$

$R\alpha$ $R\beta$ $R\gamma$ are atoms united as indicated, M being a monad atom or univalent radical—mobile under the assumed conditions which permit of a reversible reaction such as is indicated thus $\rightleftarrows$.

As, for instance, where NH:C:O may be converted into N:C·OH, and *vice versa*.

On the relation of colour to chemical constitution.

On the relation between the absorption spectra and chemical constitution of organic substances. The long spectrum of electric light discovered by Sir George G. Stokes, 1852. Stokes and also Miller's work on absorption spectra in the ultra-violet. Difficulties in obtaining pure spectra. Methods of observing ultra-violet spectra. Stokes' fluorescent screen, and Soret's fluorescent eyepiece. Singly refracting fluorspar prisms and lenses. Cornu's quartz compensated prism. The use of photography. The study of metallic spectra first necessary. Differences in spark spectra of the metals. The study of absorption spectra of homologous series and of metameric compounds Of polymerides. Special investigation of benzene derivatives. Their spectra characterised by intense general absorption. Dilution renders absorption bands visible. Essential oils substances of great commercial value. Their absorption spectra. Constituents of two kinds, those which do, and those which do not exert selective absorption. The former belong to the *aromatic group*, the latter to the *hydro-aromatic group*. Examples of phenolic substances from essential oils.

Thyme.

Thymol. C_6H_3 < CH_3 (1), C_3H_7 (4), OH (3)

Carraway.

Carvacrol. C_6H_3 < CH_3 (1), C_3H_7 (4), OH (2)

The hydrocarbon cymene 1:4 methylisopropyl benzene producible from essential oils by reagents.

C_6H_4 < CH_3 (1), C_3H_7 (4)

The terpenes $C_{10}H_{16}$ or $(C_5H_8)_n$ are dihydrocymenes—or $C^{10}H_{14}(H_2)$ or $(C_5H_8)_2$.

$$C_3H_7\cdot C \lessgtr \begin{matrix} CH-CH_2 \\ CH\ \ CH \end{matrix} > CH\ CH_3$$

Sesquiterpenes $C_{15}H_{24}$ or $(C_5H_8)_3$.

Camphor.—Japanese camphor a ketonic derivative of Borneol $C_{10}H_{18}O$ which is a hydroxytetra-hydro-cymene.

Borneol.

Bredt's formula for camphor usually adopted.

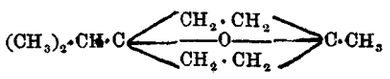
Camphor, CH < $CH_2\cdot CO$, $C(CH_3)_2$, $CH_2\cdot CH_2$ > $C\cdot CH_3$

hence

Borneol, CH < $CH_2\cdot C(OH)$, $C(CH_3)_2$, $CH_2\cdot CH_2$ > $C\cdot CH_3$

Citronellol and menthol both belong to the group of camphors, with the general formula $C_nH_{2n}O$.

Substances occurring in the oils of cajeput, eucalyptus, citronella, geranium, lemon, lign-aloe, and neroli, are cineol.



Citronellol $(CH_3)_2C:CH\cdot CH_2\cdot CH_2\cdot CH(CH_3)\cdot CH_2\cdot CHO$;

Geraniol or lemonol $(CH_3)_2C:CH\cdot CH_2\cdot CH_2\cdot C(CH_3):CH\cdot CH_2\cdot OH$;

Lign Alõol $(CH_3)_2C:CH\cdot CH_2\cdot CH_2\cdot C(CH_3)(OH)\cdot CH:CH_2$;

Nerolol from oil of neroli is believed to be identical with geraniol.

These all belong to the class of camphors with the general formula $C_nH_{2n-2}O$.

The absorption spectra of stereo-isomeric substances give no indications which serve to distinguish between lævo- and dextro-rotatory compounds, or those which are inactive.

Absorption bands observed in the visible spectrum of substances apparently colourless. Russell and Lapraik, also J. L. Schonn. In alcoholic series, the higher the alcohol stands in the series the nearer is the band to the red end of the spectrum.

The influence of atomic grouping in the molecules of organic substances on their absorption spectra in the infra-red region. Abney and Festing. Carbon compounds containing hydrogen show characteristic group of lines. Lines absent from carbon compounds containing no hydrogen. The lines do not all appear in some hydrogen compounds. Oxygen in hydroxyl obliterates the rays between two of the hydrogen lines. The carbon nucleus of a series of substances indicated by characteristic bands. Certain hydro-carbon radicals exhibit distinct absorption bands. The halogens not distinguishable. Measurements in the ultra-violet spectra, how made. Wave-lengths, oscillation-frequencies, and inverse wave-lengths. The cause of absorption bands in the spectra transmitted by benzene and its derivatives. General and selective absorption interpreted as caused by the molecular and intra-molecular vibrations respectively. The number of intra-molecular vibrations per unit of time calculated for ozone, benzene, naphthalene, and anthracene. The representation of compounds by the curves of molecular vibrations. The intensity of absorption and persistency of absorption bands evidence of greater amplitude of vibrations within the molecule. The detection of impurities by the examination of the absorption curves. Mode of obtaining spectra and drawing curves. Effect of various groupings on the spectrum. The absorption spectra of the alkaloids.

The spectra of isomeric substances. Stereo-isomeric and tautomeric compounds investigated by their spectra. Graebe and Liebermann's and von Baeyer's observations on the constitution of coloured substances and dyes. Colour-producing groups. Chromogens and chromophores. Relationship of fluorescence to colour. The modified formulæ for various colouring matters proposed by Nietzki. The theory of solutions.

Students are recommended to consult the following works:—

Scott's *Introduction to Chemical Theory.* A. Black and Sons.

Hjelt's *Organic Chemistry.*

The Spirit of Organic Chemistry: Lachmann. Macmillan and Co.

Outlines of Theoretical Chemistry: Meyer. Translation by Bedson and Carleton Williams. Longmans.

Bernthsen's *Organic Chemistry.* Translated by G. M'Gowan. Blackie and Sons.

Nietzki's *Chemistry of the Organic Dye-stuffs.* Translation by Collin and Richardson. Gurney and Jackson.

Von Richter's *Organic Chemistry.* Translated by Edgar Smith. 2 vols. Keegan Paul, Trench, Trübner, and Co., Limited.

Eiloart's *Lectures on Stereo-isomerism.*

Marsh's *Chemistry in Space.*

Van t'Hoff's *Lectures on Physical Chemistry.* Translation by R. A. Lehfeldt. Arnold.

Physical Chemistry: Nernst.

Walker's *Introduction to Physical Chemistry.* Macmillan and Co.

3. LABORATORY COURSE.

Practical and Analytical Chemistry.

The principal courses of instruction in the Chemical Laboratory are as follows:—Experimental Operations, Qualitative Analysis, Quantitative Analysis, and Instruction in Methods of Chemical Research.

Those attending the course of Qualitative Analysis receive instruction as far as possible together as a class, but the experimental work of the more advanced students is performed independently under the direction of the Professor, so that each one may commence with that branch of practical chemistry for which his previous knowledge qualifies him, and pursue such a course of study as may be considered most suitable for his future professional requirements.

Qualitative Analysis.—Each student in this course performs a series of experimental exercises, which make him practically acquainted with the *general* and *analytical* properties of the mineral bases and acids, and some of the more commonly occurring organic acids. Careful notes are made of the experiments. The knowledge thus acquired is subsequently put into practice in the performance of a series of analyses so arranged as to lead the student, step by step, from the simplest to the more complex cases of *qualitative* analysis. Instruction is given in the use of the blowpipe and the spectroscope.

Quantitative Analysis.—This course commences with a series of introductory examples intended to show, by the student's own experiments, the constancy in composition of many chemical compounds, and to demonstrate the difference between equivalent weights and atomic weights. The estimation of various constituents most commonly occurring in minerals is followed by a course of *Volumetric* and *Technical Analysis, the Analysis* of *Alloys,* and of *Complex Minerals.*

Text Book.—Professor Hartley's *Course of Quantitative Analysis.* Macmillan & Co.

Instruction in Chemical Research.—The preparation and purification of organic substances, the determination of vapour densities and boiling points, the determination of molecular weights by the solution and boiling-point methods, the methods of *organic analysis, gas analysis,* and *spectrum photography* are included in this course.

SPECIAL LABORATORY COURSES.

Students of Engineering.

Special Laboratory Courses, for which students may enter at any time during the Session for a period of three months.

For more advanced instruction the courses may be prolonged.

Practical Chemistry for Engineers.—This course is suitable for candidates for the Degree in Engineering of the Royal University.

The analysis of minerals by the blow-pipe. The preparation of standard solutions for volumetric analysis. Acidimetry, alkalimetry, determination of the hardness of water, the saltness of water, of carbonic acid in limestone, and iron in iron ores.

A three months' course, students may enter at any time.

Medical Students.

Students of the Royal University may attend a course of Practical Chemistry at any hour on four days a week during any three months of the Session. Certificates of attendance will be granted to those who have attended fully two-thirds of the course.

Public Analysts and Medical Officers of Health.

A separate course intended for those who desire to qualify themselves in State Medicine, includes the analysis of water, air, articles of food, and the use of the microscope in the detection of adulterations.

Assaying.

The assaying of the more important metals, such as iron, copper, lead, tin, alloys of silver and gold, gold and silver bullion, &c., &c., and the examination of fuel, fire-clay, ores, and metallurgical products is carried on in the Assaying Laboratory.

A Course of Laboratory Instruction in the Theory of Chemistry.

This course of Practical Chemistry is designed to supplement the instruction imparted in the lecture

room, and is recommended to those who are attending a course of lectures. The student will be required to satisfactorily perform a complete series of experiments, and to record his observations, and make the necessary calculations in his note-book. He will become familiar with the difference between elementary and compound matter. The chemical changes of matter. The constancy of composition of chemical compounds. The methods of effecting chemical combinations and decompositions. The quantity of elementary matter entering into various compounds. Methods of measuring and weighing gases, liquids, and solids. The preparation and purification of various gases, and examination of their properties. The preparation of metallic salts, and their purification by dissolving and crystallising. The process of distillation and chemical manipulation generally. Elementary qualitative analysis.

A three months' course.

Each student must provide himself with apparatus. A list of the articles required appears under the head of Laboratory Regulations. The cost is under £2.

HOURS OF ATTENDANCE.

The chemical laboratory is open daily during the session from 10 A.M. until 4 P.M., except on Saturdays.

Examinations in Practical Chemistry will be held by the Board of Education and by the College authorities in the chemical laboratories on three or four days in the months of May and June, the dates of which will be duly announced. On these occasions only those students who are candidates can be admitted.

The laboratory is closed during the Christmas and Easter vacations.

LABORATORY REGULATIONS.

I. Students in the chemical laboratory must supply themselves with a set of apparatus, and maintain at their own cost the stock of perishable articles in glass and porcelain which they will require.

List of Apparatus required.

Platinum wire, 6 in.
Platinum foil, 2 in. by 1 in.
Test tube stand, 24 holes.
Test tubes, 18, size 6 in. by ¾ in.
Do. 12, size 5 in. by ½ in.
Basket for holding test tubes.
Boiling tubes, 2, size 8 in. by 1¼ in.
Test tube brush.
Set of 5 beaker glasses.
German flasks, 1 each, 2 oz., 4 oz., 8 oz., 16 oz., and 30 oz.
Berlin porcelain crucible, 1 each, 1¼ in., 1½ in. diameter.
Berlin porcelain evaporating dishes, 1 each, 2¾ in., 3½ in., and 4 in.
Porcelain mortar and pestle, 3 in. diameter.
Crucible tongs.
Japanned tin blowpipe.
Funnels, 1 each, 1½ in., 2 in. diameter.
,, 3 ,, 2½ in. diameter.
Wire gauze, 1 piece, 5 in. square
Watch glasses, 4, of 2 in. diameter.
Glass tube, soft, 3-16 to ¼ in. diameter, ½ lb. in lengths of 2 ft.
Glass tube, hard combustion, 3-16 in. bore, 1 lb. in lengths of 2 ft.
Glass rod, 3-16 in. diameter, ¼ lb. in lengths of 2 ft.
Red india-rubber tube, 4 ft., ⅜ in. bore.
Black india-rubber tube, ⅛ in. bore, 2 ft.
Triangular file, 1.
Scissors, 1 pair.
Steel spatula, 1.
Glass cloths, 2.
Coarse flannel, 1 piece.
Six sticks of charcoal.
Box for apparatus.
Two packets Schleicher & Schull's filters, No. 589 each, 9 and 11 m. (3½ and 4¼ in.) diameter.

For *Quantitative Work.*

1 desiccator with bell jar, 6 in. high, by 4 in. in diameter.
1 platinum crucible to hold 1 oz. of water.
1 set of gramme weights.

Students who have not attended the course of lectures on Theoretical Chemistry, and are deficient in theoretical knowledge, must be provided with an additional supply of apparatus according to the following list:—

A small set of gramme weights.
Combustion tubing, 1 pound.
A set of three rat-tail files for boring corks.
½ oz. of silver nitrate.
6 feet of magnesium tape.
An iron screw clip to fix on a retort stand to hold tubes.

II. Each student has the exclusive use of a table containing a cupboard and drawers, with gas and water supply, and a set of stoppered bottles containing the ordinary re-agents.

III. A certain number of pieces of apparatus will be provided by the College and lent to the students on the distinct understanding that they be returned clean and in good order, or new apparatus must be provided. Such articles are Bunsen gas-burners, retort stands, tripod stands, filter stands, Liebig's condensers, agate mortars, &c.

IV. Balances, barometers, thermometers, burettes, and graduated vessels are provided by the College, and under certain restrictions platinum vessels. All damage and breakages must be made good at the students' expense.

ZOOLOGY.

PROFESSOR:———Vacant.
DEMONSTRATOR:———Vacant.

NATURAL SCIENCE FACULTY.

The first part of the course is designed to illustrate the general principles of Animal Biology, with corresponding laboratory instruction.

The Frog will be taken as a typical animal, and its external characters, internal anatomy, histology, physiology, and embryology will be studied, and comparisons made with other forms.

Other lectures and practical lessons will be devoted to various groups of animals in order to introduce to the student the main types of structure, the relation of animals to their surroundings, the inter-relations between animals and plants or other animals, the social life of animals, the struggle for existence, and other phases of animal life.

The succeeding Lectures and Laboratory Instruction will be so organised as to give the students a general knowledge of Systematic Zoology, Comparative Anatomy, Embryology, the Geographical Distribution of Animals, Bionomics and other branches of Zoology. Students will be instructed in the methods of the preservation of tissues, cutting sections, and other branches of Zoological technique. Every facility is afforded to those who wish to engage in original research.

Each student will be provided with a full Syllabus for the Lectures, and with detailed notes for the Courses of Laboratory Instruction.

Non-Associate Students.

Non-Associate Students who require more advanced instruction, such as that required for the B.A. Pass Examination of the Royal University, should attend the Second Year's Course of the Natural Science Faculty. The special types required for such examinations will be provided.

More advanced Non-Associate Students should take the Course of the First Term of the Third Year, and, if necessary, repeat the lectures given during the First Term of the Second Year of the Natural Science Faculty.

BOTANY.

PROFESSOR T. JOHNSON, D.SC., F.L.S., M.R.I.A.
DEMONSTRATOR, G. H. PETHYBRIDGE, PH.D., B.SC.

* The course in Botany in the second year of the Natural Science Faculty consists of about sixty lectures and illustrative practical instruction. It begins in the first week in October, and is continued throughout the Session, on two or three days a week, to the middle of June.

* The course in Botany will be adapted to the requirements of the students in agriculture in training in the College.

The object of the course is to give a general and practical knowledge of the leading principles of the chief divisions of plant-life.

The laboratory instruction will illustrate, as far as possible, the principles of the science considered in the accompanying lecture course.

Each student will be taught the use of the simple and compound microscopes, the preparation of microscopic sections, and will be required to make careful drawings of the anatomical characters examined.

The course will be fully illustrated by fresh and by prepared specimens, diagrams, and experiments.

Field excursions will take place as circumstances permit. Part III. (Systematic Botany) will be carried out in the Laboratory at the Royal Botanic Gardens, Glasnevin.

PART I.—STRUCTURAL BOTANY.

Histology.

The history, structure, and properties of the vegetable cell.

Protoplasm, nucleus, cell-sap, cell-wall. Their physical and chemical properties. The specific energy of the cell.

The substances produced in the protoplasm (chlorophyll and other organic matters). Mode of growth of the cell.

Cellulose, lignin, cutin, suberin, mucilage.

The formation of cells and of the different kinds of tissues. Their functions.

Karyokinesis and fragmentation of nucleus.

Sub-Kingdom I.—*Phanerogamia or Spermaphyta.*

Class I.—*Angiosperms.*

Morphology and Histology of Angiosperms.

Morphology of the stem and its modifications. Modes of branching of the stem, buds, vernation. Structure of the stem; growing point, stele, cambium, phloem, xylem—secondary thickening.

Morphology of the leaf.—Foliage and other leaves.

Simple and compound leaves. Phyllotaxis.

The different parts of the leaf—leaf-base, stipules, petiole, lamina. Structure of these parts.

Stomata.

Secondary thickening of the stem, in detail, resulting in formation of tree-trunks (*e.g.*, *Tilia*, *Quercus*). The leading characters of timber, of flax, and other fibres.

Periderm (superficial, internal),—cork—lenticels—ring, and scale bark. Grafting. Layering.

Morphology and anatomy of the root-system—root-cap—growing point—secondary thickening.

Root-hairs—lateral roots—fibrous, fleshy, arboreous types.

Aquatic plants.

Laticiferous tissue (cells, vessels). Function. Rubber.

Reproduction.

The inflorescence and its modes of branching; bracts and bracteoles.

The difference between indefinite and definite inflorescences: the distinctive characters of the following kinds:—raceme, spike, spadix, panicle, umbel, capitulum, scape, cyme of various types, glomerule, corymb.

The non-essential and essential organs of the flower: aestivation: the symmetry of the flower. Floral diagrams and formulæ.

The modifications of the flower due to cohesion, adhesion, suppression, and multiplication of the various parts.

Morphology of the perianth, androecium, and gynoecium. The calyx; the sepals; their form, arrangement, and function. The corolla: the petals; their form, arrangement, and function.

Floral glands—position—structure—function. Extra-floral glands.

The structure and use of the stamen; the filament, anther, pollen-sacs, pollen; their development and homologies.

The structure of the carpel; the stigma; the style; the ovary; the placenta.

The structure and form of the ovule; the embryo-sac and its contents. Development and homologies.

The various processes of pollination. Fertilisation. Reduction of chromosomes.

The different kinds of fruit: the distinctive characters of the various kinds, including achene, glans, drupe, berry, legume, capsule, (pyxidium).

The structure of the seed, endosperm, perisperm.

Structure and position of the embryo, nature of the aril.

Apogamy. Polyembryony. Dissemination of fruits and seeds. Production of varieties by hybridisation, &c.

The various modes of germination. Function of cotyledons. Ferments. Changes in food-materials in germinating seeds, tubers, &c.

The different provisions for the persistence of the individual plant; annuals, biennials, perennials.

Class II.—*Gymnosperms.*

Leading characters of comparison between the Gymnosperms, the Angiosperms, and the Pteridophyta.

Order 1.—*Coniferae.*

The morphology and life-history of the Coniferae as illustrated by Pinus, Abies, &c.

Comparison of the Coniferae in stem, leaf, root, and reproduction with the Dicotyledons and Monocotyledons.

Sub-Kingdom II.—*Pteridophyta* (Vascular Cryptogams).

[Class I.—*Lycopodinae.*

1.—*Selaginellaceae.*

Habit. Heterophylly. Ligule. Apical cell. Branching. Rhizophore. Stele. Tracheïdes. Vessels. Heterospory. Archesporium. Nature of gametophyte. Embryogeny.

2. *Lycopodiaceae* (Recent and Fossil).

a. Lycopodieae. Lycopodium. Phylloglossum. Homospory.

b. Psiloteae. Psilotum. Tmesipteris.

Habit. Vascular system. Synangium. Distribution.]

Class II.—*Equisctinae. Equisetum.*

Habit. Reduced vascular system.

Apex of stem and root. Leaf-sheath. Propagation.

Strobilus. Homospory. Gametophytes.

Relation to *Calamites.*

Class III.—*Filicinae.*

The life-history of the ordinary ferns, as illustrated by *Aspidium* and *Pteris.*

Classification.

Sub-Kingdom III.—*Bryophyta* or *Muscineae.*

Class I.—*Musci* as illustrated by *Polytrichum* and *Sphagnum.*

Foliose gametophyte. Conducting strand.

Apical cell. Sexual organs. Paraphyses.

Spore, Protonema. Vegetative reproduction.

Sporangium. Amphithecium. Endothecium.

Archesporium. Alternation of generations.

Peat. Its structure and properties.

Comparison with the *Hepaticae.*

Sub-Kingdom IV.—*Thallophyta.*

Nature of thallus. Asexual and Sexual reproduction.

Principles of classification.

Class I.—Algæ. The kelp weeds.

Class II.—Fungi (including Bacteria and Lichens).

The life-histories of the fungi of the chief plant-diseases. Fungicides.

The chief types studied in the laboratory in illustration of this part of the course will be:—

Helianthus, Linum, Solanum, Ulmus or *Tilia, Lilium, Zea, Dracaena, Pinus* or *Abies, Selaginella, Lycopodium, Equisetum, Aspidium, Pteris, Funaria, Marchantia* or other *Liverwort, Fucus, Laminaria, Vaucheria, Spirogyra, Agaricus, Puccinia, Ustilago, Claviceps, Sclerotinia, Phytophthora, Mucor, Saccharomyces, Bacillus.*

PART II.—VEGETABLE PHYSIOLOGY.

NOTE.—As far as possible this course will be treated experimentally in the laboratory.

The Vegetable Cell.—Structure and composition of Protoplasm, Nucleus, and Plastids. The osmotic properties of the cell (Turgescence, Plasmolysis). Physical and chemical properties of the cell-wall, in its various modifications.

Nutrition.—The chemical constituents of plant substance as revealed by analysis. The essential and the non-essential elements in the food-materials of plants. Synthetic cultures of plants in nutrient solutions. Probable functions of the inorganic elements of plant ash. Absorption of solutions of salts by roots from the soil. Properties of the soil. The selective properties of roots.

The manufacture of organic food-materials by the plant. Autotrophic plants. Photosynthetic assimilation of Carbon dioxide. Historical resumé. Chemical composition and physical properties of Chlorophyll and other allied colouring matters. The products of Photosynthesis. Structure and composition of Starch grains. Influence of light and other factors on Photosynthesis. Chemosynthesis of Carbon dioxide in "nitrite and nitrate" organisms. Mixotrophic and Heterotrophic plants. Special modes of nutrition in Saprophytes and Symbionts. Conjunctive and Antagonistic symbiosis (Parasites).

The supplies of Nitrogen compounds to the plant. Historical resumé. Assimilation of free nitrogen by soil organisms. Symbiosis of organisms in roots (Root-nodules in Leguminosae, &c.) Supplies of Nitrogen from Nitrates and compounds of Ammonia and from Amides, Peptones, &c., (Carnivorous plants). The formation, transport, and storage of nitrogenous and non-nitrogenous reserve materials.

The Movement of Water in the Plant.—Absorption of water. Exudation of water in liquid form in uninjured and in amputated organs. Exudation pressure ("Root pressure," Bleeding, Weeping, &c.). The excretion of Nectar. Evaporation of water in the form of vapour from the plant, (Transpiration). Measurement of, and effects of, external conditions on Transpiration. The ascent of sap in trees.

Respiration.—Products of and measurement of activity of aërobic respiration. Influence of temperature and other factors on respiration. Anaërobic (intramolecular) respiration. Fermentation.

Growth.—Structure, properties, and tension of growing organs. Mechanics of growth. Periodicity of growth. Measurement of growth. Effect of external conditions on growth.

Movement.—Movement of naked protoplasm, single cells; amoeboid and ciliary movements; Heliotaxis, Chemotaxis, Rheotaxis. Movement of Protoplasm, &c., within closed cells. Circulation, Rotation. Movements in position of Chromoplasts. Curvature—(*a*), Curvature caused by unequal imbibition of water (Hygroscopic movements); (*b*) Curvature caused by unequal growth; spontaneous (automatic)—epinasty, hyponasty; paratonic (due to stimulus), heliotropism, geotropism (twining plants), hydrotropism, chemotropism, thermotropism, rheotropism; (*c*), Curvatures due to contact; Climbing plants and tendrils. Movements due to variations in Turgor; Autonomic, (Desmodium, &c.); paratonic, sleep movements; movements due to mechanical stimulus, (Sensitive plant).

Reproduction.—Rejuvenescence, fission, gemmation; sexual reproduction, isogamous and anisogamous.

Relations of reproduction to heat, nutrition and growth. Fertility and sterility.

Parthenogenesis; apogamy; hybridisation.

Special physiology of spore and seed formation and germination.

Geographical Distribution of Plants.—The physiological factors which influence and modify plant structure. "Adaptation" of plants to their environment. Hydrophytes, Mesophytes, Xerophytes (Halophytes). The main characteristic groupings of plant associations on the earth's surface.

PART III.—SYSTEMATIC BOTANY.

(*Phanerogams.*)

The general structural and economic characters of the main British and certain Exotic natural orders of Flowering Plants will form the subject of this course. Special attention will be given to plants of agricultural interest, either as fodder plants or as weeds of a more or less injurious character (parasitic, poisonous, &c.). As time allows attention will be given to the various ways of eradicating weeds, to the identification of seeds, to seed-testing and the composition of pastures, including, *e.g.*, in the grasses, recognition by their foliage.

The course will be largely of the nature of practical lessons, often given in the field. The aim of the course is to give students a working knowledge of the commoner wild and cultivated plants of Ireland. The course (Part III.), can be taken separately by Non-Associate students in the second term of the Session.

THIRD YEAR'S COURSE.

PART IV.

There will be a course of lectures on such general branches of Botany as are not considered in the second year's course, the fee being £1.

The students will have a short course on Palæobotany and on Geographical Distribution.

There will be, in the course on Systematic Botany, a more detailed examination of the Natural Orders, including the study of the development of the flowers in some cases.

The course on Vegetable Physiology will be made as practical as possible.

Students will be instructed in the methods of original research.

Visits to the Royal Botanic Gardens, Glasnevin, and to places of botanical interest in the neighbourhood of Dublin district will be made.

The Botanical Collections in the Science and Art Museum are open daily, and explanations of special groups preserved there will be given, from time to time, to students.

BOTANICAL LABORATORY.

AT THE ROYAL BOTANIC GARDENS, GLASNEVIN.

Students attending the Botanical Classes at the Royal College of Science will be allowed the privilege of studying in the Laboratory at the Royal Botanic Gardens, Glasnevin, daily, upon obtaining the recommendation of the Professor of Botany. Specimens suitable for study will be supplied as required. Students requiring botanical specimens for home study will also be supplied with approved examples on application through the Professor. The following rules must be observed:—

1. Students who wish to work in the Laboratory at Glasnevin must be provided with a card of admission, issued on the recommendation of the Professor of Botany by the Director of the Science and Art Institutions. On each visit to the Laboratory they must sign their names in a book provided for the purpose.

2. Students can only be admitted to the Laboratory upon week days, and at such hours as the Gardens are open to the public.

3. Each student must prepare a list, signed by himself, of the plants he wishes to study. The list is to be presented to the Keeper of the Royal Botanic Gardens; the plants named, or others equivalent to them, so far as they may be obtainable, will then be supplied.

4. As far as possible, students will be permitted to use any instruments and books in the Laboratory, which are of such a nature that the student cannot be expected to provide them.

5. Students will be held responsible for any damage done to the Laboratory and its fittings, or to any books or apparatus placed at their disposal.

Non-Associate students begin the Botanical course *in the first term (first Tuesday in October).*

Non-Associate students aiming at acquiring a general knowledge of the subject (*e.g.*, candidates for the examinations of the Royal University), should take a special course, in Parts I.--III.

For a still more advanced knowledge (such, *e.g.*, as for the M.A. of the Royal University), to enable a student to pursue research work, a special course of lectures and laboratory work, Parts I.--IV., should be taken.

MINERALOGY AND GEOLOGY.

PROFESSOR GRENVILLE A. J. COLE, M.R.I.A., F.G.S.
DEMONSTRATOR, T. CROOK, A.R.C.SC.I.

MINERALOGY.

Course of about thirty Lectures, and about forty-five hours' Practical Work, in connection with the lectures.

For those who require special or additional practical work, special courses of one month are arranged.

INTRODUCTORY.

Scope of Mineralogy, and its relation to Chemistry, Physics, Geology, and Agriculture. Brief sketch of the history of mineralogical observation.

I. CHARACTERS EXHIBITED BY MINERALS. PRINCIPLES OF MINERALOGY.

1. COLOUR.—Iridescence. Schillerisation.

2. TRANSPARENCY.—Translucency and opacity.

3. LUSTRE.

4. MALLEABILITY.—Brittleness. Tenacity.

5. FLEXIBILITY.

6. ELASTICITY.

7. HARDNESS.—Scale of Mohs. Use of the pocket-knife. Sclerometry.

8. STREAK.—Streak-plates.

9. SPECIFIC GRAVITY.—Range among minerals. Modes of determination. Simple instruments useful to travellers.

10. TOUCH (FEELING GIVEN WHEN TOUCHED).

11. TASTE.

12. MODE OF OCCURRENCE AND AGGREGATION.—Epimorphs and pseudomorphs.

13. CRYSTALLINE FORM.—*Principles of Crystallography.* Planes or faces. Edges. Solid angles. Zones. Planes and axes of symmetry. Crystallographic axes. Intercepts or parameters.

The thirty-two types of crystallographic symmetry. Grouping of these under six systems. Sub-division of the hexagonal system adopted by many authors.

Determination of the crystallographic axes in forms belonging to the several systems. The "principal axis" in the hexagonal and tetragonal systems. Arbitrary determination of axes in the monoclinic and triclinic systems.

Selection of *unit forms* for different mineral species. The *fundamental law of crystallography*, which controls the deviations from the unit form in any species. This law is based on observation.

Principles of Notation, for the convenient description of crystal-faces. Systems of Weiss, Miller, and Naumann. Universal adoption of the principle of Miller's notation.

Holohedral, hemihedral, and tetartohedral forms. The adoption of the more recent views on symmetry renders all simple forms equally holohedral. *Combinations* of simple forms. "Hemimorphism" as the result of the combination of forms of low symmetry.

Description of the forms commonly occurring in each of the crystallographic systems.

Twin-crystals. Repeated twinning. Penetration-twins.

Imperfections of natural crystals.

Goniometry. Contact and reflective goniometers. Simple forms easily constructed.

14. CLEAVAGE.—Its relation to crystal-form.

15. FRACTURE.

16. PHOSPHORESCENCE AND FLUORESCENCE.

17. MAGNETIC PROPERTIES.

18. ELECTRIC PROPERTIES.

19. CORROSION-FIGURES, produced by natural or artificial etching.

20. OPTICAL CHARACTERS. The undulatory theory of light; dependence of colour on the period of the undulation. *Refraction* in crystals. *Polarisation. Double refraction.* Distinction of the two resulting rays in each case as a "slow ray" and a "fast ray." The *optic axis* of *uniaxial* minerals (*i.e.*, minerals of the tetragonal and hexagonal systems). So-called "optic axes" of *biaxial* crystals.

Polariscopes. Use of the polarising microscope and thin sections of minerals. *Interference-colours* observable in anisotropic minerals. Isotropism of minerals of the cubic system. *Circular polarisation.* Use of *convergent polarised light* to determine the uniaxial or biaxial character of minerals.

Absorption of light by crystals. Pleochroism. Haidinger's *dichroscope.* Its utility in the determination of gems.

21. PERCUSSION-FIGURES.

22. THERMAL CHARACTERS. Intimate relation between these and the crystallographic and optical characters.

23. FUSIBILITY. Von Kobell's scale. More refined methods of observation.

24. CHEMICAL CHARACTERS. Dimorphism and trimorphism. *Isomorphous series.* Modes of alteration. *Pseudomorphs.*

Simple chemical tests. Use and importance of the *blow-pipe.*

25. CRYSTALLOGENY. Modes by which crystalline minerals may have arisen in the earth's crust.

II.—DESCRIPTIVE MINERALOGY.

1. PRINCIPLES OF CLASSIFICATION OF MINERALS. Convenience of basing the arrangement on chemical constitution. In the present course, the minerals are grouped according to their prominent constituents, the "ores" of the same metal being thus brought together. This is sometimes styled an "economic" classification. The elements which form the basis of the classification are grouped according to the periodic law of chemistry, the eighth group being taken first, and the first group last. The complex silicates are treated as a separate group. The names of minerals of primary importance are printed in italics.

2. *Group VIII.*

IRON. Native Iron. *Pyrite.* Marcasite. *Pyrrhotine. Mispickel. Hæmatite. Ilmenite. Magnetite.* Chromite. Franklinite. *Limonite.* Göthite. *Siderite.* Ilvaite. Vivianite. Copperas. *Wolfram.*
NICKEL. Millerite. *Nickeline.* Breithauptite. Chloanthite. Zaratite. *Garnierite.*
COBALT. *Cobaltine.* Smaltine. Erythrine.
PLATINUM. *Native Platinum.*

3. *Group VII.*—

MANGANESE. Alabandine. Polianite. *Pyrolusite.* Hausmannite. *Manganite. Psilomelane. Wad.* Asbolan. Braunite. Dialogite. Rhodonite.

4. *Group VI.*—

SULPHUR. *Native Sulphur.*
MOLYBDENUM. *Molybdenite.*
URANIUM. Torbernite. *Pitchblende.*

5. *Group V.*—

ARSENIC. Native Arsenic. *Realgar. Orpiment.*
ANTIMONY. Native Antimony. *Antimonite.* Kermesite. Valentinite.
BISMUTH. *Native Bismuth.* Bismuthine.

6. *Group IV.*—

CARBON. *Diamond. Graphite.*
SILICON. *Quartz. Chalcedony. Opal.* Tridymite. Cristobalite.
TITANIUM. *Rutile.* Anatase. Brookite.
ZIRCONIUM. *Zircon.*
TIN. Stannine. *Cassiterite.*
LEAD. *Galena.* Jamesonite. Clausthalite. Minium. *Cerussite.* Phosgenite. *Pyromorphite.* Mimetite. Anglesite. Crocoite. Wulfenite. Stolzite.

7. *Group III.*—

ALUMINIUM. *Cryolite. Corundum.* Diaspore. *Bauxite. Spinel. Andalusite.* Sillimanite. Kyanite. *Topaz. Kaolin.* Wavellite. Native Alums. Aluminite.

8. *Group II.*—

GLUCINUM. Phenakite. *Beryl.*
CALCIUM. *Fluorspar. Calcite. Aragonite.* Wollastonite. Sphene. *Apatite.* Anhydrite. *Gypsum.* Scheelite.
MAGNESIUM. Brucite. Magnesite. *Dolomite. Talc.* Meerschaum. Boracite. Epsomite.
ZINC. *Zinc-blende.* Wurtzite. Zincite. *Smithsonite.* Hemimorphite. Willemite.
CADMIUM. Greenockite.
STRONTIUM. Strontianite. *Celestine.*
BARIUM. Witherite. *Barytes.*
MERCURY. Native Mercury. Amalgam. *Cinnabar.*

9. *Group I.*—

HYDROGEN. *Water.*
SODIUM. *Rock-Salt.* Trona. Soda-Nitre. Borax.
POTASSIUM. Sylvine. *Nitre.*
COPPER. *Native Copper. Chalcosine. Copper Pyrites. Bornite. Tetrahedrite.* Tennantite. Atacamite. *Cuprite.* Tenorite. *Malachite.* Azurite. Dioptase. *Chrysocolla.* Liebethenite. Olivenite. Chalcanthite.
SILVER. *Native Silver. Argentite.* Stephanite. *Pyrargyrite.* Proustite. Polybasite. Kerargyrite.
GOLD. *Native Gold.* Electrum. Sylvanite.

10. *Silicates.*—

FELSPARS. *Orthoclase. Soda-orthoclase.* Microcline. Soda-microcline and Anorthoclase. *Albite. Oligoclase.* Andesine. *Labradorite.* Bytownite. *Anorthite.*

FELSPATHOIDS. *Leucite. Nepheline.* Sodalite. Nosean and Haüyne.

PYROXENES. Enstatite. Bronzite. *Hypersthene.* Diopside. Acmite and Ægirine. *Augite.* Diallage. *Aluminous Soda-pyroxenes.* Spodumene.

AMPHIBOLES. Anthophyllite. Gedrite Tremolite. *Actinolite.* Jade. *Asbestos. Hornblende.* Aluminous Soda-amphiboles.

IOLITE DIVISION. Iolite.

GARNETS. Grossularite. *Pyrope. Almandine.* Spessartine. Andradite. Ùvarovite.

OLIVINE DIVISION. *Olivine.*

SCAPOLITES. Scapolite.

VESUVIANITE DIVISION. Vesuvianite.

EPIDOTES. Zoisite. *Epidote.* Allanite.

PREHNITE DIVISION. Prehnite.

STAUROLITE DIVISION. Staurolite.

ZEOLITES. *Natrolite. Stilbite.* Analcime. Apophyllite. Chabazite. Harmotome.

MICAS. *Muscovite.* Paragonite. Lepidolite. *Biotite.* Phlogopite.

CHLORITOID DIVISION. Chloritoid.

CHLORITES. *Clinochlore. Pennine.* Prochlorite.

SERPENTINE DIVISION. *Serpentine.*

GLAUCONITE DIVISION. *Glauconite.*

BOROSILICATES. Axinite. *Tourmaline.*

PRACTICAL WORK AND MINERALOGICAL LABORATORY.

A typical series of about 150 specimens is placed in the College Library. These specimens are intended to be handled, with due care, side by side with the reading of ordinary text-books.

A more extended series is displayed in the cases in the teaching collections, and every specimen in this series is brought out for use during the practical work of the ordinary course.

The Laboratory work of this course also enables the student to have practical acquaintance with the following characters of minerals, and thus with the mode of distinguishing one mineral from another:—

Hardness; specific gravity; crystalline form, including the measurement of angles by various goniometers, and the study of crystal-models; optical properties, including the use of the polarising microscope; special blowpipe reactions useful in the discrimination of minerals. The blowpipe work is conducted with grease-lamps, and, as far as possible, under conditions similar to those encountered by a traveller away from the resources of a laboratory.

The Laboratory is also open for practical work at hours to be arranged with the Professor, when courses may be undertaken to suit individual requirements.

Students should provide themselves with:—

A pocket-lens, preferably the ordinary triplet form.

A blowpipe.

About 6 inches of fairly thin platinum wire.

No text-book is absolutely necessary, but F. Rutley's "Mineralogy" is recommended as a handy work of reference, and is convenient for the pocket.

Books suggested for reference:—E. S. Dana, "Text-book of Mineralogy"; Lewis, "Crystallography"; Wülfing, "Uebersicht der 32 krystallographischen Symmetriegruppen"; F. Rutley, "Mineralogy." For the minuter details of species, see J. D. Dana, "System of Mineralogy," and Hintze, "Handbuch der Mineralogie." For optical properties, see Groth, "Physikalische Krystallographie," 3rd edition, 1894.

GEOLOGY.

PROFESSOR GRENVILLE A. J. COLE, M.R.I.A., F.G.S.

DEMONSTRATOR, T. CROOK, A.R.C.SC.I.

Course of about fifty-five Lectures, with Field Excursions in addition, and about twenty Palæontological Demonstrations.

PRACTICAL WORK IN LABORATORY.

See end of Syllabus.

INTRODUCTORY.

Meaning of the term "Geology," and scope of the science. Brief sketch of the history of geological observation.

I.—PHYSICAL GEOLOGY AND GEOGRAPHY.

1. COMPOSITION OF THE EARTH'S CRUST AND ITS INTERIOR.—Chemical elements occurring most abundantly. Distinction between Minerals and Rocks. Possible composition of the interior of the Earth; evidence of meteorites. Density of the Earth as a whole, and of the crust. Evidence of internal heat. Theories as to physical constitution of the interior.

2. ROCK-FORMING MINERALS.—Summary of the characters most useful to geologists, including the elements of microscopic examination.

3. IGNEOUS ROCKS.—Volcanoes and their products. Lava-flows; structures arising in these. The interior of volcanoes; dykes; highly crystalline masses. Structures in igneous rocks. Classification and mode of study.

4. CLASSIFICATION OF IGNEOUS ROCKS.—Characters by which these rocks may be distinguished from one another, and which should serve as guides in their practical employment.

Predominant Felspar, Orthoclase.		Predominant Felspar, Plagioclase.			Felspar usually absent.
Acid.	Intermediate.			Basic.	Ultrabasic.
Granite Series.	*Syenite Series.*	*Quartz-Diorite Series.*	*Diorite Series.*	*Olivine-Gabbro Series.*	*Peridotite Series.*
Granite.	Syenite (and Nepheline Syenite).	Quartz-Diorite.	Diorite and Gabbro.	Olivine-Gabbro.	Peridotite.
Eurite (Quartz-Felsite).	Compact Syenite.	Quartz-Aphanite.	Aphanite and Dolerite.	Olivine-Dolerite.	Compact Peridotite.
Rhyolite.	Trachyte (and Phonolite).	Rhyolitic Andesite.	Trachytic and Basaltic Andesites.	Olivine-Basalt.	Hemicrystalline Peridotite.

Altered forms:—Felsite; Porphyrite; Diabase; Melaphyre; Palagonite; Variolite; Serpentine.

5. PHENOMENA ATTENDING THE CLOSE OF VOLCANIC ACTIVITY.—Gaseous and liquid products. Sinter. Travertine.

6. SEDIMENTARY ROCKS.—Tuffs and volcanic ashes laid out in water. Meteoric deposits. Production of ordinary sedimentary rocks by Denudation.

Agents of Denudation. The Atmosphere and its moisture. Ice and Snow; the snow-line and glaciers. Movement of glaciers. Conditions affecting the *Climate* of any place on the surface of the earth.

Disintegration of rocks by various agents. Dew; Rain; Springs; action of Rivers; Wind; Glacial striation; action of the Sea; Organic agents; nature and origin of soils.

Transport of the disintegrated material, and its accumulation to form new rock-masses. Action of Rivers and Floods. Underground waters; Stalactite-caves. Wind and Sand-dunes. Glaciers as agents of transport. Accumulation in the sea and in lakes, both in solution and in suspension. Drying-up of lakes. Organic agents of accumulation; forest-beds; shell-banks; coral-reefs; radiolarian and foraminiferal deposits.

Characteristics of Sedimentary Rocks.—Fragmental or encrusting character. Stratification. Ripple-marks, Sun-cracks, &c. Fossil remains. Value of fossils in determining the relative age of strata.

7. CHARACTERS ARISING IN SEDIMENTARY ROCKS AFTER THE PERIOD OF THEIR FORMATION.—Joints. Concretions. Pseudomorphic action. Mineral infiltrations.

8. CLASSIFICATION OF SEDIMENTARY ROCKS.—Characters by which these rocks may be distinguished from one another, and which should serve as guides in their practical employment.

Mode of Origin.	Siliceous.	Argillaceous.	Calcareous.	Miscellaneous.
Deposited from suspension.	Sand.	Kaolin-beds. Mud.	Limestone-Mud.	Stream-Tin deposits, &c.
Deposited from solution.	Quartz-rock in veins. Siliceous Sinter of Geysers.	—	Travertine. Stalactites, &c. Oolitic deposits.	Gypsum beds. Rock-Salt. Bog Iron-ore.
Deposited by organic agency.	Diatomaceous. Radiolarian, and Siliceous Sponge Oozes. Siliceous Sinter of Geyser basins (?)	—	Shell-banks. Coral-reefs. Foraminiferal Ooze. Deposits of Calcareous Algæ.	Bone-beds. Peat and Forest beds. Bog Iron-ore in part.
Consolidated representatives	Sandstone. Grit. Many Quartzites.	Clay. Marl. Loam. Shale.	Oolitic and organically formed Limestones.	Lignite beds. Brown Coal.
Segregative and pseudomorphic forms, and products of chemical change.	Flint (Chert).	—	Calcareous concretions.	Coal. Anthracite. Clay-Ironstone. Dolomitic Limestone and Dolomite.

Pebble-beds, taluses, moraines, conglomerates, &c., resulting from aggregation of fragments of various rocks.

9. MOVEMENTS OF THE EARTH'S CRUST.—Earthquakes; results of their systematic study. Slow movements of elevation and subsidence in the Earth's crust. Results of these movements. Dip and strike; use of clinometers. Folds and faults. Brecciation of rocks. Unconformity.

10. METAMORPHIC ROCKS.—Rocks in contact with igneous masses. Regional metamorphism. Cleavage. Foliation. Various modes of origin of Schist and Gneiss.

11. CLASSIFICATION OF METAMORPHIC ROCKS.

FORMED FROM SEDIMENTARY ROCKS.

Siliceous.	Argillaceous.	Calcareous.	Miscellaneous.
Many Quartzites.	Slate. "Spotted Shale" and "Spotted Slate."	Crystalline Limestone.	Schistose Alabaster.
		Calciphyre.	Graphite-Schist.
Quartz-Schist.	Many Mica-Schists.	Calc-Schist.	Crystalline Dolomite.

FORMED MAINLY FROM IGNEOUS ROCKS.—Mica-Schist, Hornblende-Schist, Chlorite-Schist, Talc-Schist, Serpentine-Schist. Gneiss (Eye-gneiss, Ribbon-gneiss, &c.).

12. ORIGIN OF SCENERY AND PHYSICAL FEATURES OF THE EARTH'S SURFACE.—Escarpments. Mountains. Cañons and Valleys. Plains and Deserts. Lakes. Fjords and Bays. Islands. Continents and Oceans. Present relations of Land and Water on the Earth's surface.

13. GEOLOGICAL MAPS AND SECTIONS.—Signs used, and principles of construction.

II. STRATIGRAPHICAL GEOLOGY.

1. "STRATA IDENTIFIED BY ORGANISED FOSSILS."—Work of William Smith. Palæontological zones.

2. THE PAST HISTORY OF THE EARTH, as far as revealed by stratified deposits. Division of the deposits into Systems. The characters of these in the localities where they are best developed, but with special reference to the British Isles and Colonies.

The Systems are subdivided into Series and Stages, and are treated of in order, beginning with the oldest or Pre-cambrian deposits (Group A below).

D. CAINOZOIC OR TERTIARY GROUP.

Systems.	Series.
14. Post-Pliocene and Recent.	—
13. Pliocene, ...	Astian. Placentian. } East Anglian Crag Stages. Messinian (=Antwerp Crag).
12. Miocene, ...	Tortonian and Œningen Series. Helvetian. Burdigalian.
11. Oligocene, ...	Upper (=Aquitanian). Lower (=Fluvio-marine Stages of the Isle of Wight).
10. Eocene, ...	Bartonian. Bracklesham Series. London Series.

C. MESOZOIC OR SECONDARY GROUP.

Systems.	Series.	Stages.
9. Cretaceous, ...	Upper,	Danian. Senonian (U. Chalk). Turonian (M. Chalk). Cenomanian (L. Chalk).
	Lower,	Albian (Gault Clay and part of Folkestone Beds). Aptian (Part of Folkestone Beds; Hythe Beds). Urgonian (Atherfield Clay). Neocomian (Wealden).
8. Jurassic, ...	Upper,	Purbeck and Portland Stage (Tithonian). Purbeck Beds. Portland Beds. Kimeridgian. (Kimeridge Clay). Corallian and Oxfordian Stage. Coralline Oolite. Oxford Clay. Kelloway Beds.
	Middle,	Bathonian. Cornbrash. Forest Marble. Great Oolite. Bajocian. Inferior Oolite. Midford Sands (link with U. Lias).
	Lower,	U. Lias. M. Lias. L. Lias.

System.	Series.
7. Triassic, ...	Rhætic. Keuper and Upper Alpine Series. Muschelkalk Series. Bunter and Werfen Series.

B. PALÆOZOIC OR PRIMARY GROUP.

(a.) *NEWER PALÆOZOIC SUB-GROUP.*

Systems.	Series.
6. Permian, ...	
5. Carboniferous, ...	Coal-Measures Series. Millstone-Grit Series. Yoredale Series. Carboniferous Limestone Series.
4. Devonian, ...	Upper. Middle (=Eifelian). Lower.

(b.) *OLDER PALÆOZOIC SUB-GROUP.*

Systems.	Series.
3. Silurian (as restricted),	Ludlow Series. Wenlock Series. Llandovery Series.
2. Ordovician, ...	Bala and Caradoc Series. Llandeilo Series. Arenig Series.
1. Cambrian, ...	Upper Series (Tremadoc and Lingula Flags Stages). Menevian. Taconian (Olenellus Series).

A. ARCHÆAN (PRECAMBRIAN) GROUP.

Systems at present established locally, and, in the absence of fossils, not easily correlated one with another.

III. DEMONSTRATIONS ON PALÆONTOLOGY.

I. *Introductory.*—Relation of Palæontology to Biology and Geology. Extinction of species. Persistent types. Imperfection of the geological record.

II. Characteristics of the genera most important to the geologist, arranged under the following groups:—

a. ANIMALS.

I.—*Protozoa.*

1. *Rhizopoda.*—Foraminifera. Radiolaria.

II.—*Metazoa.*

1. *Porifera.*—Calcareous and Siliceous Sponges.
2. *Cœlenterata.*—Hydrozoa. Actinozoa.
3. "*Vermes.*"—Annelida. Polyzoa. Brachiopoda.
4. *Mollusca.*—Lammellibranchiata. Scaphopoda. Gastropoda. Peteropoda. Cephalopoda.
5. *Echinodermata.*—Crinoidea. Cystidea. Blastoidea. Echinoidea. Asteroidea. Ophiuroidea.
6. *Arthropoda.*—Crustacea. Arachnida. Insecta.
7. *Vertebrata.*—General sketch of the progress of vertebrate life in the successive geological periods.

b. PLANTS.—General sketch of the progress of vegetable life in the successive geological periods.

To be demonstrated by reference to fossils, recent specimens, and diagrams.

PRACTICAL WORK AND GEOLOGICAL LABORATORY.

Series of specimens are arranged so as to be accessible to the students, and practical demonstrations in the Field form part of the above geological course.

The Laboratory is open from 1.45 to 4 on Tuesdays throughout the first term, for a systematic elementary course of practical work, including:—

1. The determination of rocks and of their modes of origin, including an outline of the use of microscopic sections. Physical examination of sands, clays, and soils.

2. The study of geological maps, and the construction of sections from them. Illustrations of particular districts, known to the student.

The Laboratory is also open for practical work at hours to be arranged with the Professor, when courses may be undertaken to suit individual requirements.

Students should provide themselves with:—

A pocket-lens, preferably the ordinary triplet form.
A geological hammer.
A colour-box.

No text-book is absolutely necessary, but Sir A. Geikie's "Class-book of Geology" (4*s.* 6*d.*), or Lapworth's "Intermediate Text-book of Geology," is recommended for the ordinary course.

The course of Practical Work in connection with the Faculty of Natural Science includes the subjects of the elementary course given above, and the following in addition:—

1. The preparation of thin sections of rocks, and the systematic study of rock-slices, in connection with the specimens from which they have been cut.
2. The application of laboratory-work to specimens of rocks collected in the field, with a view to connecting such observations with the broader and open-air aspects of the earth's crust.
3. The principles of geological mapping, as illustrated in the field and by the maps of various surveys.
4. The detailed study of one or more groups of fossils, as an introduction to palæontological research.

Throughout this course, the students will be encouraged to examine and determine specimens collected by themselves, and to consult the publications of learned Societies and other authorities, as would be required if they were engaged in original investigation.

Books suggested for reference:—A. Geikie, "Text-book of Geology," and "Class-book of Geology"; Lapworth's "Intermediate Text-book of Geology"; Green, "Physical Geology"; Jukes-Browne, "Physical and Historical Geology"; De Lapparent, "Traité de Géologie"; Judd, "Volcanoes"; Teall, "British Petrography"; Hull, "Physical Geology of Ireland"; Kinahan, "Geology of Ireland"; Cole, "Aids in Practical Geology." For Palæontology, Manuals by Zittel, Bernard, and by Nicholson and Lydekker; Woods, "Palæontology"; Seward, "Fossil Plants"; Scott, "Studies in Fossil Botany."

APPLIED MATHEMATICS AND MECHANICS.

PROFESSOR W. M'FADDEN ORR, M.A.
DEMONSTRATOR, J. P. JOHNSTON, M.A.

As the instruction in Pure Mathematics is not a part of the courses of the Professor of Applied Mathematics, but only a preparation for these courses, any Associate Students who can satisfy the Professor as to their attainments in Pure Mathematics are not required to attend the lectures or exercises, but must work in the College during those hours.

Every Student must be provided with a note-book in which he is to neatly write out the solutions of problems proposed in the class, and he must be prepared to submit this note book for the inspection of the Professor at such times as the latter may deem advisable.

The courses are illustrated by diagrams, models, machines, and simple experiments.

I. PURE MATHEMATICS.—FIRST YEAR.

About 100 Lessons.

Euclid—Book II.--VI.
Easy deductions.

Algebra—Elementary algebra, including quadratic equations, proportion, progressions. Permutations and combinations, binomial theorem. Nature and use of logarithms.

Trigonometry.—Up to the solution of triangles.

II. MECHANICS.—FIRST YEAR.

About 60 Lessons.

The parallelogram of forces. Forces in one plane acting at a point on a body. Resultant of parallel forces. Couples. Moments. Equilibrium of a body acted on by forces in a plane. Centres of gravity of a triangle, quadrilateral, tetrahedron, pyramid, cone, cylinder. Friction. The "simple powers" (treated as free from friction). The lever. The pulley, and systems of pulleys. The inclined plane, with and without friction. The wheel and axle. The common balance. The steelyards. Velocity ratio. Mechanical advantage. Work. Velocity. Acceleration. Units of space, time, velocity and acceleration. Motion with uniform acceleration. Motion in a straight line under gravity. Newton's laws of motion. Momentum. Units of force and of mass. Atwood's machine. Impulse. Impact (simplest cases). Work done by a force. Kinetic energy. Composition and resolution of velocities. Acceleration of a point not moving in a straight line. Composition and resolution of accelerations. Miscellaneous theorems.

III. PURE MATHEMATICS.—SECOND YEAR.

About 75 Lessons.

Analytic Geometry.—The equations of the Conic Sections deduced from their definitions with their elementary properties.

Differential Calculus.—Differentiation from first principles. Differentiation of simple functions and of inverse functions. Geometrical illustrations. Successive differentiation of functions of one independent variable. Maxima and minima values of functions of one independent variable. Application of the Differential Calculus to the geometry of plane curves referred principally to Cartesian coordinates.

Integral Calculus.—Definitions. Elementary integrals. Integration by substitution. Integration by parts. Integration by rationalization. Integrations by method of partial fractions. Elementary definite integrals. Easy applications of the Integral Calculus to the quadrature and rectification of plane curves and to the determination of the volumes and surfaces of solids of revolution, and of moments of inertia. Amsler's planimeter.

IV. MECHANICS.—SECOND YEAR.

About 65 Lessons.

Statics.—The subjects of the first year's course treated more fully. Duchayla's proof of the parallelogram of forces. The parallelogram of couples. Moments of forces about lines. Poinsot's central axis. Centre of parallel forces. Centres of gravity. Application of the integral calculus to find the centre of gravity of a body. The centre of gravity of an arc of a circle, sector of a circle, surface and volume of a sphere between two parallel planes, and volume of sector of sphere. The laws of friction and problems on friction. Work. Virtual work of a force. Virtual work condition of equilibrium. A fuller consideration of the "mechanical powers. Effect of friction and weight of a pulley. Relation between power and weight in the screw. Requisites of a good balance. Miscellaneous theorems.

Dynamics.—The subjects of the first year's course treated more fully. Acceleration in general. The hodograph. Resolution of accelerations. Curvature. Circle of curvature. Radius of curvature. Newton's laws of motion. Motion under the action of gravity. Morin's apparatus. Motion on a rough plane. Impact and collision. Uniform circular motion. Simple harmonic motion. Composition of any number of harmonic motions of equal periods. Elliptic harmonic motion. Two harmonic motions of slightly different periods in same straight line. Varying amplitude of their resultant, and the mean value of its square. Crank and connecting rod. Donkin's harmonograph. Physical illustrations. Interference of sound waves. Beats. Spring and neap tides. Interference of light as in Fresnel's mirrors or biprism. Resultant of two harmonic motions of different periods. Blackburn's pendulum. Tisley's compound pendulum. Lissajou's figures. Motion in a smooth vertical circle. The simple pendulum. Time of small oscillation. Motion on a smooth cycloid with its axis vertical. Evolutes and involutes. Evolute of a cycloid. The conical pendulum. Revolution in a vertical circle. Pressure on the curve. Meaning of work. Kinetic energy. Kinetic energy of body rotating round a fixed axis. Meaning of moment of inertia. Calculation of moments of inertia in simple cases. Motion of a solid body rotating round a fixed horizontal axis. The compound pendulum. Equivalent simple pendulum. Centre of oscillation. Kater's pendulum. Centre of percussion. Differential equation of motion of body rotating round a fixed axis. Rectilinear motion under a force directed to a fixed point. Law of gravitation. Kepler's laws for orbits supposed circular. Rough verification of law of gravitation from moon's motion round earth. Approximate comparison of the masses of the sun, earth and planets having satellites.

And the following without many quantitative mathematical investigations:—

Moments and products of inertia. Principal axes. Centrifugal force. Resultants of the forces a rotating body exerts on its supports. Conditions it should be "in balance." Axes of steady rotation. Stability and instability. Gyrostats. Their behaviour when acted on by forces. Rule giving direction of motion of axis of rotation. Gyrostat suspended with perfect freedom. Foucault's experiment. Effects of friction in the supports. Effect of rifling on projectiles. Precession and nutation. Causes of the precession of the equinoxes.

Hydrostatics.—Definition of a fluid and of a perfect fluid. Measure of fluid pressure. Pressures at the same point equal in all directions. Intensity of pressure at a given depth. Any pressure applied to surface transmitted equally to all parts. Magnitude and line of action of pressure of a liquid on a horizontal area immersed. Centre of pressure. Its position in simple cases. General formulæ for plane area of any form. Vertical and horizontal components of the resultant pressure of a liquid on any curved surface. Principle of Archimedes. The hydrostatic balance. Conditions of equilibrium of a solid floating in a liquid. Energy of immersion.

V. APPLIED MECHANICS AND HYDRODYNAMICS.

About 65 Lessons.

Graphic statics. Coplanar non-concurrent forces. Force and funicular polygons. Beam on two supports loaded in different ways. Shearing force and bending moment at any point. Effect of a travelling load. Position of load when bending moment at a given point greatest. Several travelling loads. Curves of maxima shearing forces and bending moments. Stationary loads. Stress diagrams for various roof trusses. Braced structures of the most general form. Structures with redundant bars. Wind pressure. Suspension chains. Analysis of stress. Principal stresses. Ellipse of stress. Hydrostatic stress. Shearing stress. Analysis of strain. Simple longitudinal strain. Shear. Pure strains. Relations between stress and strain in an isotropic solid. Coefficients of shear and of volume elasticity. Young's modulus in terms of these. The bending of elastic beams. The Bernoulli-Eulerian theory. Differential equation of neutral fibre. Beams supported in various manners and loaded in various manners. Coulomb's theory of torsion. Solution for circular cylinder. General effect of Saint Venant's correction in other cases. Hydrodynamical analogy. Fluids, perfect fluids, liquids, gases. Intensity of pressure. General equations of the equilibrium or motion of a perfect fluid. The equation of continuity. Velocity potential. Steady motion. Integration of equations of motion along a stream line. Efflux from a small orifice. Vena Contracta, coefficients of contraction, velocity, resistance and discharge. Approximate values for simple orifice. Large orifices in vertical plane. Fluid rotating round a vertical axis; free and forced vortices. Definition of viscosity. Laws of surface friction of fluids. Surface friction of pipes. Discharge of pipes. Open channels. Hydraulic mean depth. Virtual slope. Loss of energy by eddies; sudden enlargements and contractions. Coefficients of resistance. Fluid jets. Pressure due to impact of a jet. Equations of motion of any system of bodies. Linear and angular momenta. Impulse and reaction water motors. The common undershot wheel. The Pelton wheel. "Barker's mill." Turbines. Thomson's turbine. Centrifugal pumps. Thomson's vortex chamber. Giffard's injector. Tendency of rivers to become crooked.

VI. MECHANISM AND THERMODYNAMICS.

About 65 Lessons.

Mechanism.—Definition of a machine. Belts and pulleys. Form of rim of pulley. The lifting jack. The bell-crank levers. Oscillatory motion in a straight line. Simple harmonic motion. Crank and connecting rod. Diagrams showing relative displacements and velocities. Instantaneous centre of rotation. Space-centrode and body-centrode. Eccentrics. The compensation for wear of drill in a copying lathe. The copying lathe. Anderson's machine for compressing rifle bullets. Punching machine worked by eccentric. The swash plate. Escapements for clocks and watches. Conditions to be fulfilled as far as possible. The crown wheel, anchor, and deadbeat escapements. The cylinder, lever, and chronometer escapements. Harrison's going fusee. Cams. The rifling machine. Reversing motions by spurwheels, by bevel wheels, and by open and crossed bands. Quick returns. The planing machine. The slit bar motion. The oscillating engine. The shaping machine. Linkwork. The four bar motion. The parallelogram. Locomotive coupling rod. Dead points and change points. Buchanan's and Morgan's feathering paddle wheels. Metal shears. The Stanhope levers. The knuckle joint. "Parallel motions." Scott Russell's, Robert's, Watt's, the Grasshopper, Tchebicheff's, Peaucellier's, Hart's, and others. Teeth of wheels. Spur wheels. Pitch curves. The most general method of obtaining forms of teeth to work together. Cycloidal, involute, point, and pin teeth. Fewest number of teeth practically admissible. Racks and pinions. Composition of angular velocities. Analogies between theorems in statics and in kinematics. Screw motion. Most general way in which a body can move. Bevel wheels. Skew bevel wheels; the pitch surfaces. Screw cutting. Aggregate and differential motions. Epicyclic trains. Watt's sun and planet wheels. Differential motion for winding thread on bobbins. The cordelier. Feed motions for drilling and boring machines. The oval chuck. Hooke's joint.

Reuleaux's analysis of mechanisms. Elements, pairs, links, chains. Complete and incomplete closure. Force

closure. Higher and lower pairs. Three and only three lower pairs. The four bar or lever crank chain. Alteration in size and extent of links of a chain. The slider crank chain. The crank and connecting rod. The eccentric. Result of fixing a different link of a chain. The oscillating engine. The Whitworth shaping machine. The double slider-crank chain. Elliptic compasses. Elliptic chuck. Oldham's coupling. Punching machine worked by eccentric. Anderson's machine for compressing bullets. Alteration of a mechanism by omitting links.

Thermodynamics.—Brief sketch of caloric theory of heat. Heat developed by friction. Explanation of calorists. Rumford's experiments. Davy's experiments. Joule's experiments. Dynamical equivalent of heat. First Law of Thermodynamics. Cycles. Energy. Carnot's cycle. Efficiency of engine with such a cycle the greatest possible. Second Law of Thermodynamics. Thomson's absolute scale of temperature. Laws obeyed approximately by natural permanent gases. Joule's experiment showing energy of a gas sensibly independent of temperature. Definition of a perfect gas. Absolute temperature by a perfect gas. The two specific heats of a gas. Newton's formula for velocity of sound. Laplace's correction. Rankine's calculation of the two specific heats of air. Pressure and volume diagrams. Adiabatic curve for gases. The scale of temperature by a perfect gas thermometer and Thomson's scale the same. Extension of Carnot's cycle. Clausius' theorem. Entropy. Partial differential coefficients. The "four thermodynamic relations." Lowering of temperature of melting point of ice by increased pressure. Joule and Thomson's "porous-plug" experiments. Apparent contradictions of Second Law of Thermodynamics. Available energy. Properties of steam. Its latent heat. Regnault's determination of its density. Its calculation from the thermodynamic formula. Relation between pressure and volume of saturated steam. Specific heat of steam at constant pressure. Energy of steam. Wet steam. The dryness fraction. Superheated steam. The adiabatic equation of steam. The drying of steam by throttling. Entropy of steam. Entropy-temperature diagrams. Transformation of a pressure-volume diagram into a temperature-entropy one. Actual behaviour of steam in the cylinder. Typical actual diagram. Wire drawing. Clearance. Compression. Cushion steam. Influence of the cylinder walls. Condensation and re-evaporation. Wetness of the working steam. Representation on the diagram of the water present. Uses of the temperature-entropy diagram. Thermodynamic loss due to initial condensation. Action of a steam jacket. Influence of size, speed, and ratio of expansion. Superheating. Compound expansion. Results of experiments. Testing of steam engines. The indicator. Heat supply. Calorimeters for measuring wetness of steam. Transfer of heat between the steam and the cylinder. Hirn's analysis. Air and gas engines. Stirling's, Ericsson's, and other types of engines. Refrigerating machines. Explosive gas engines. Heat generated by combustion of coal gas. Cycle of the Otto engine. Its actual efficiency and defects.

VII. MATHEMATICAL PHYSICS.

About 65 Lessons.

Electricity and Magnetism.—Attraction of gravitating matter. Mathematical definition of potential. Partial differential coefficients. Gauss's theorem. Attraction of solid or hollow sphere, of infinite solid or hollow cylinder, of infinite plane. Perfect conductors. As consequence of law of attraction all the charge on a conductor is on outer surface. Principle of Cavendish's proof of the law of force. Laplace's and Poisson's equations. Force outside a charged surface. System of conductors. Total work in charging. Relations between potentials and charges. Coefficients of capacity and of induction. Mechanical force on charged conductor. Lines and tubes of force. Expression for energy in the field. State of stress in the dielectric. Capacity of conductors. Condensers. Two concentric spheres. Two infinite coaxial cylinders. Two parallel plates. The guard ring and quadrant electrometers. Meaning of specific inductive capacity. Polarization. Expression for energy. Law of force. Magnetic potential. Magnetic force. Magnetic moment. Potential due to an indefinitely small magnet. Meaning of magnetic shell. Potential due to a uniform magnetic shell. Mutual energy of magnetic shells. Force acting on shell when placed in magnetic field. Force due to shell. Theory of vibration of magnetic needle in the earth's field. Definition of magnetic induction. Tubes of magnetic induction. Coefficients of induced magnetism. Magnetic permeability. Hysteresis. Current electricity. Distribution of a steady current in a system of conductors. Theory of Wheatstone's bridge. Conjugate conductors. Magnetic force due to circular current. Solenoid. Mechanical forces on current in magnetic field. Force between two infinitely long parallel currents. Coefficients of mutual and self induction. The ballistic galvanometer. Electromagnetic induction. Law of induction. Circuit rotating in the earth's field. Periodic electromotive force in a circuit possessing inertia. Distribution of rapidly alternating currents. Theory of transformers. Screening off of electromagnetic induction. Discharge of Leyden jar. Mechanical force on moving circuit. Lenz's law. Electromagnetic measurements. Electrical units and dimensions.

Light.—Simple harmonic motion. Composition and interference of harmonic vibrations. Average kinetic energy. The vibrations of light in some respects analogous to harmonic vibrations. Intensity of illumination. Vibrations of permanent type. Polarized light. Rectilinear propagation of light. Principle of Huyghens. Reflection and refraction of waves at a plane surface. Interference fringes. Two small apertures. Fresnel's mirrors and biprism. The colours of thin plates. Newton's rings. Elementary theory of diffraction. A straight edge. A narrow wire. An opaque circular disc. Diffraction gratings. Polarization and double refraction.

The books which Students should procure are as follows:—

First Year.—*Euclid* (any edition), Todhunter's is recommended; Hall and Knight's Algebra; Warren's Trigonometry; Loney's Elementary Mechanics.

Second Year.—Smith's Conic Sections; Williamson's Differential Calculus; Williamson's Integral Calculus; Williamson and Tarleton's Dynamics; Greaves' Statics.

Third Year.—*Applied Mechanics Class.*— Cotterill's Applied Mechanics.

Third Year.—*Mechanism and Thermodynamics Class.*—Goodeve's Mechanism; Preston's Heat or Maxwell's Heat; Ewing's Steam Engine.

Third Year.—*Mathematical Physics Class.*—J. J. Thomson's Electricity and Magnetism; Preston's Light.

DESCRIPTIVE GEOMETRY AND ENGINEERING.

PROFESSOR J. LYON, M.A.
ASSISTANT, J. TAYLOR, A.R.C.SC.I.

FIRST YEAR.—PLANE AND DESCRIPTIVE GEOMETRY.

About 45 Lectures.

Plane Geometry.—Scales. The division of straight lines by diagonal ruling; by means of the vernier. The application of vernier to philosophical instruments such as the theodolite. Two forms of vernier. Graphic arithmetic. The multiplication and division of numbers by means of lines. Fractions by same method. The representation of areas by lines.

Involution and evolution. The evaluation of algebraic expressions.

Conic sections. Methods of drawing the circle, ellipse and parabola.

The reduction of irregular figures to regular triangles or polygons.

The division of areas such as triangles and parallelograms by straight lines drawn through given points.

Tangents to circles under given conditions. The method of solution of certain problems by means of similar figures.

Figures of equal area and perimeter.

ORTHOGRAPHIC PROJECTION.

Definitions of planes of projection, or co-ordinate planes, and of the traces of lines and planes.

Straight lines parallel or perpendicular to planes.

Lines parallel or perpendicular to lines. Points of intersection of lines with planes to which they are perpendicular or oblique.

Intersections of planes with each other when oblique or perpendicular to each other.

Horizontals drawn in planes. Their use in the solution of problems.

The angles between lines and planes.

The angles between planes.

The projection on different planes.

Changing of the ground line. Surfaces of revolution. Ruled surfaces. Developable surfaces. The cone, cylinder, and hyperboloid of revolution.

The curves of intersection of cylinders with each other, of cylinders with cones, and of cones with each other.

Tangent planes to spheres, cylinders, and cones.

The plans and elevations of plane figures when their planes or sides are oblique to the planes of projection.

Plans and elevations of regular solids, tetrahedron, cube, &c., on oblique planes.

ISOMETRIC PROJECTION.

Isometric scales. Scales for use parallel to axes and in directions oblique to axes. Examples.

PERSPECTIVE.

The field of view. The effects of change of station point.

The method of projection.

Method of vanishing points and measuring points.

Vanishing points for lines oblique to picture plane. So-called "distortion" of wide angle views. Examples.

SECOND YEAR.— ENGINEERING.

STEAM AND MACHINE CONSTRUCTION.

About 75 Lectures.

Introductory Course to the Steam Engine.

Belt-Pulleys, Fly-wheels, Shafting Hangers, Pedestals.

Screws; their pitch, strength, and varieties.

Taps and Dies—Details of Engine Design—Cylinders.

Pistons, Valves, Metallic Packings.

Condensers, Circulating Pumps, Air Pumps.

Injectors, theory and design of.

Compound Engines—Zeuner's Valve Diagrams.

Steam Jackets and Lagging.

Steam Boilers—Cornish, Lancashire, Tubular, and Tubulous Boilers, and those for Domestic purposes.

Machine Tool Design—The Lathe, Planing, Drilling, Slotting, and Shaping, and boring Machines.

Wood Working Machinery—Wobbling Saws, Dovetailing Saws—Spur Wheels—Gas Engines—Indicator Diagrams and Dynamometers.

MECHANICAL DRAWING.

The Students will be taught to make general arrangements of Machines and Engines, and working drawings of the details of these as used in engineering works.

Students are taken to see works as far as possible in illustration of the instruction given.

A short Course in testing and strength of materials. Demonstrations in lathe and machine work, hardening and tempering of Steel, case hardening of Iron, and in moulding for Brass and Iron castings, are given by the Professor of Engineering.

THIRD YEAR.—ENGINEERING.

BUILDING CONSTRUCTION.

About 75 Lectures.

Setting out Foundations from Plans. Methods of making Foundations. Damp Courses—Plinths. Floors and Joists. Damp-proof walls. Brickwork.

Joinery—Doors and Frames. Windows, Casements and Sashes. Ceilings in plaster or wood.

Roofs—Slating, Tiling and Lead work; Plumbers' work generally. Wall-plates, Rafters, and Battens. Gutters, Valleys, Flashings, Rolls and Soakers.

Timber—Seasoning and Felling. Deal, Pine, Oak, Mahogany and Walnut Wainscot.

Bricks—Hand made. Machine made. Rubbers. Arch Bricks. Terra Cotta. Stone Work—Varieties of stone and methods of dressing and setting.

Cast Iron—Hot and Cold Blast. Foundry Pig—Hematites. Mixtures for different purposes—Malleable Iron process—Wrought Iron. Steel. Tool Steel, Mild, and Self-hardening Steel. Tempering. Case hardening and Chilling. Chilled and Grain Rolls.

Admiralty and Board of Trade requirements for Steel Gunmetals and Brasses.

Treatment of Sewage.

Locks and Weirs—Flow of water in pipes and sewers.

Railways—Making and setting out the Road. Embankments and Cuttings—Ruling Gradient. Stress. Ellipse of Stress. Pressure of earth on retaining walls. Depth of Foundations for lofty buildings. Embankments for Railways across marshy ground. Traction of Locomotives. Elevation of Rail. Forms of Rails, Chairs, and Sleepers, Crossings, Points, &c. Continuous Brakes.

Tramways—Making and Maintaining. Different Methods of Haulage. Road Making—Country roads, City roads. Sewering, Traps, and Repairing.

Tunnelling—Setting out with Transit or Theodolite. Shafts, Centreing, &c.

Dynamics of Steam Engine. Energy of Fly-wheels. Bending Moments of Connecting Rods. Theory of Governors. Stresses in Cylinders, Piston Rods, Bedplates, &c.

Calculations of Strains in Iron Bridges, and their general Design.

Students are taken to see works as far as possible in illustration of the instruction given.

SURVEYING.

About 20 Lectures.

Chain Survey. Box Sextant. Hadley's Sextant. Abney's Level. Theodolite Errors and Adjustments. Telemetry. Keeping the Field Book. Levelling—Theodolite Survey.

Students are taken out for practical work as the weather permits.

Students will be occupied during the hours assigned in time table to Drawing, in making Drawings of the subjects described in lectures.

(6.)

TABLE showing the NUMBER of STUDENTS who attended the various Courses in the ROYAL COLLEGE OF SCIENCE FOR IRELAND during the Three Decennial Periods 1872–81, 1882–91, 1892–1901

(See the Evidence of Mr. T. P. GILL, q. 4032.)

Courses Taken.	Decennial Period 1872-81.											Decennial Period 1882-91.											Decennial Period 1892-1901.										
	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	Average per annum.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	Average per annum.	1891-92.	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.	1900 1.	Average per annum.
ASSOCIATES :—																																	
Manufactures, .. 2nd year,	1	1	3	2	2	2	2	2	3	4	3·6	1	3	3	3	2	-	2	4	1	2	4·1	2	3	3	2	-	2	1	-	-	2	2·9
3rd year,	-	1	-	2	1	2	1	2	2	3		4	1	3	3	2	2	-	2	2	2		2	2	2	2	2	-	2	1	1	-	
Engineering, ... 2nd year,	5	1	4	5	1	3	1	3	1	-	4·8	2	1	4	1	6	8	-	2	8	4	6·4	5	4	5	8	5	6	3	4	4	1	7·3
3rd year,	1	4	1	3	4	1	1	1	2	1		-	2	1	4	1	6	6	-	1	7		2	3	2	-	4	5	4	2	3	3	
Mining, ... 2nd year,	-	-	4	1	2	2	1	-	1	1	2·4	1	1	-	1	1	7	2	2	3	2	3·6	2	-	1	-	1	1	2	1	-	-	1·8
3rd year,	1	-	-	4	1	2	2	1	-	1		1	1	1	-	1	1	5	2	2	2		2	3	-	1	-	1	1	1	1	-	
Applied Physics,* 2nd year,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	1	1·5
3rd year,	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	2	-	1	2	
Physical Science,† 2nd year,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3rd year,	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
Natural Science,‡ 2nd year,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	0·2
3rd year,	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	1	
Agriculture, ... 2nd year,	-	*	-	-	-	-	-	-	-	-	0·1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3rd year,	1	*	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
First-year Students, ...	7	8	7	3	5	5	8	7	8	4	6·2	12	8	7	10	19	6	11	14	13	15	11·5	13	18	14	13	19	10	14	10	14	31	15·6
NON-ASSOCIATES :—																																	
Chemistry, ...	11	6	23	21	16	12	25	15	13	8	15·0	29	18	25	22	25	13	25	28	28	36	24·9	23	37	33	30	36	25	33	31	32	27	30·7
Assaying, ...	1	-	-	-	-	1	-	-	-	1	·3	1	-	-	-	-	-	1	-	4	2	·8	3	1	2	5	16	7	12	11	3	7	6·7
Physics, ...	8	3	6	11	17	24	16	22	21	8	13·6	37	11	15	15	15	12	40	43	36	42	26·6	35	37	46	26	22	20	14	21	24	29	27·1
Engineering,*	1	1	4	4	5	8	6	6	12	6	5·3	9	6	8	13	8	10	7	9	16	20	10·6	18	8	15	10	10	8	8	11	15	23	12·6
Mining, &c., ...	1	1	-	1	-	4	3	-	4	-	1·4	3	1	4	7	7	7	3	-	6	3	4·1	2	3	1	1	5	6	7	7	1	-	3·3
Geology, &c., ...	2	1	6	3	1	4	5	3	3	2	3·0	1	-	6	7	3	5	4	4	5	2	3·7	9	4	5	3	16	13	3	7	6	5	7·1
Botany, ...	1	2	1	2	2	6	7	1	2	1	2·5	1	5	9	11	10	10	14	11	10	2	8·3	10	9	9	6	17	15	7	12	9	13	10·7
Zoology, ...	1	-	-	-	-	1	3	-	1	-	·6	1	3	10	12	9	13	18	15	10	11	10·2	7	5	9	6	10	11	16	8	6	7	8·5
Mathematics, ...	4	4	1	2	3	1	4	3	5	3	3·0	4	3	3	5	3	1	3	5	12	6	4·5	12	11	12	3	6	4	4	6	8	9	7·5
Agriculture, ...	-	2	2	2	1	1	-	-	-	-	·8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS, ...	46	35	62	66	61	79	85	66	78	43	59·1	107	64	99	114	112	101	141	141	157	158	119·3	147	148	159	116	170	136	135	135	131	161	144·8

* Faculty suspended.

† These Faculties were created 1895-96.

‡ This Faculty was ... ed in 1896-97.

(7.)

TABLE showing the NUMBER of DIPLOMAS taken in the ROYAL COLLEGE of SCIENCE for IRELAND during the three Decennial Periods, 1872-81; 1882-91; 1892-1901.

(See the evidence of Mr. T. P. GILL, q. 4229.)

COURSE.	Decennial Period, 1872-81.											Decennial Period, 1882-91.											Decennial Period, 1892-1901.										
	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Total.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	Total.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	Total.
Manufactures, ...	-	1	-	2	1	2	1	2	2	3	14	4	1	3	3	2	2	-	2	2	2	21	2	2	2	2	2	-	2	1	2	-	15
Engineering, ...	1	4	1	3	4	1	1	1	2	1	19	-	2	1	4	1	4	6	-	1	7	[26	2	4	2	-	4	5	2	2	3	3	27
Mining, *	1	-	-	4	1	2	2	1	-	1	12	1	1	1	-	1	1	5	2	2	2	16	2	2	-	1	-	1	1	1	1	*	9
Agriculture,*	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Physics, Applied,†	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	1	4
Physical Science,†	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Science,‡	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
											46§											63§											56‖

* Faculty suspended 1872-3 † These Faculties were created 1895-96. ‡ Faculty created 1896-97 § No record as to nationality. ‖ English, 26; Irish, 27; Scotch, 2; Other Nationality, 1.

DOCUMENTS, I.

(8.)

RETURN showing the PROPORTION of COST to the State for year 1900–1 of the INSTITUTIONS of SCIENCE and ART under the Department of Agriculture and Technical Instruction for Ireland (*exclusive* of Maintenance of Buildings, Furniture, Fuel, Lighting, Stationery, Printing and Binding provided by the Board of Public Works and H. M. Stationery Office).

(See the Evidence of Mr. T. P. GILL, q. 4177.)

	Royal College of Science.	Metropolitan School of Art.	SCIENCE AND ART MUSEUM.				Royal Botanic Gardens, Glasnevin.	National Library of Ireland.	Total
			Natural History Division.	Botanical Division.	Art and Industrial Division (including Irish Antiquities Division).	Total.			
SALARIES:—	£	£	£	£	£	£	£	£	£
Administration, Proportion of,	480	274	180	60	478	718	200	235	1,907
Technical Staff,	3,752*	1,689	1,130	287	1,321	2,738	400	1,160	9,739
Attendants, Cleaners, &c.,	938	488	613	306	716	1,635	–	1,035	4,096
Fireman,	–	35	12	11	12	35	–	–	70
Artisans, &c.,	–	50	845	122	1,932	2,899	2,341	–	5,290
Lectures to Gardeners,	–	–	–	–	–	–	50	–	50
Summer Courses,	208	20	–	–	–	–	–	–	228
Examinations, Prizes, &c.,	1,334	–	–	–	–	–	–	–	1,334
Fittings, Materials, &c.,	–	30	600	148	1,100	1,848	50	–	1,928
Travelling,	36	39	56	8	144	203	33	17	333
Incidental Expenses and Advertising.	163	30	120	60	180	360	30		583
Purchase of Apparatus, Specimens, Books, &c.	1,017	146	545	135	2,171	2,851	738	1,285	2,067
	8,008	2,301†	4,101	1,137	8,054	13,292	3,842	3,732	31,675

* £700 4s. share of Students' Fees was also paid to Professors and Assistants, &c.
† Deduct Fees received from Students, £397, and credited to vote, net cost £2,404.

III.

DOCUMENTS, III.

Document put in by R. Blair, Esq., M.A., B.Sc., Assistant Secretary in respect of Technical Instruction of the Department of Agriculture and Technical Instruction for Ireland.

MINUTE of the COMMITTEE OF COUNCIL ON EDUCATION IN SCOTLAND, dated 24th August, 1900, providing for the Administration and Distribution of Grants for Science and Art Instruction in Scotland.

(See the Evidence of Mr. BLAIR, q. 4655.)

At Dover House, Whitehall, the 24th day of August, 1900.

BY THE LORDS OF THE COMMITTEE OF HER MAJESTY'S MOST HONOURABLE PRIVY COUNCIL ON EDUCATION IN SCOTLAND.

Read the Minute of the Committee of Council on Education in Scotland, dated 29th January 1900, providing for the administration and distribution of grants for Science and Art Instruction in Scotland.

Resolved—

That in the case of Higher Class Schools or other similar Schools not in receipt of grant under the provisions of the Scotch Code, the conditions of grant from the sum of money voted annually by Parliament for Instruction in Science and Art in Scotland shall be as follows:—

I. The Managers of any such school may submit a scheme for the instruction of the pupils in,—

A. Physical and Natural Science.
B. Drawing (which may include Modelling).
C. Practical Geometry and Educational Handwork of any approved form.
D. Cookery, Laundry Work, Dressmaking, or other form of Practical Household Economy.

and such scheme, when approved, may be made the basis of grants in accordance with the following regulations:—

(a.) No scheme will be approved under this article unless the department is satisfied that the curriculum of the school makes due provision for the instruction of the pupils in the other main branches of a general education.

(b.) No grant will be made on account of the instruction of any pupil in B., C., or D. who is not under regular instruction in A., in a course which satisfies the conditions of the next following subsection.

(c.) No grant will be made on account of instruction in A. unless (1) the time-table of the school provides for a satisfactory amount of instruction in Mathematics (including Higher Arithmetic), and (2)

due provision is made in properly equipped laboratories for experimental work on the part of the pupils in courses approved by the Department.

(d.) The minimum number of hours per week recognised for a grant in A. shall be three hours, of which not less than two shall be occupied in practical work on the part of the pupils.

(e.) No grant will be made on account of instruction in C. unless on the one hand it is related to the instruction in Mathematics, and on the other is exemplified in its application to some practical purpose.

No grant will be made on account of work in wood, iron, cardboard modelling, or other similar occupation, which is not preceded or accompanied by instruction in Practical Geometry.

(f.) Not more than 40 pupils shall be taken at a time by one teacher for theoretical instruction in any of these subjects, nor more than 20 for practical instruction, unless a laboratory assistant is provided, in which case the number may be increased to 30.

(g.) Practical instruction must be given in lessons of at least two periods (1 hr. 20 mins.) duration. The time-table of the school must be arranged so as to leave sufficient time to the Science teacher for laboratory preparation.

(h.) *The instruction in all subjects for which grant is claimed must be given by teachers whose qualifications are proved to the satisfaction of the Department.

(i.) No attendances of any pupil who is under 12 years of age, or who has not obtained a Merit Certificate, or otherwise given proof to the satisfaction of the Department of equivalent attainments, may be reckoned for grant.

II. When these conditions are fulfilled, and when the Department are satisfied on the Report of their Inspector that the profession of work has been satisfactorily carried out, a grant may be made on the average attendance of duly qualified pupils, at the rate of 10*s.* for each hour per week of instruction throughout the school year in A., 5*s.* in B., and 6*s.* 8*d.* in C. and D. Provided that no attendances in A. shall be reckoned in any week on account of pupils who have not made the qualified number of hours of attendance at that course within the week, nor shall attendances for theoretical instruction alone in any one week be reckoned.

(a.) For the purpose of this Article the normal school year shall be regarded as 40 weeks, and the numbers on which the grants for each course are to be calculated, at the foregoing rates, will be determined by adding together the number of hours of attendance made during the year by all the pupils attending that course, and dividing by 40.

(b.) The instruction in each course must extend over the whole school year, except where the Department, in consideration of special circumstances, sanctions another arrangement, and must be, as far as possible, evenly distributed throughout the year.

III. In schools which provide a course of instruction in A. or C., acording to an improved scheme, and extending over more than two years, the rate of grant for instruction in these courses may be increased by one-half, but only on account of the further attendance of pupils who have successfully completed a two years' curriculum, and have been in attendance for not less than 300 hours at the courses of instruction in A., or in A. and C. conjointly. This additional grant may be made on account of instruction in A. alone, or in both A. and C., if instruction in C. has been given to a reasonable extent in the two previous years. Provided always that not less than eight hours per week are given to A. by the pupils whose attendances are reckoned for the additional grant.

(a.) Pupils who have completed a course of at least three years, in accordance with the foregoing regulations, will be eligible for admission to the Leaving Certificate Examination in Science, and the result of such examination may be taken into account in the award of the additional grant under this article.

IV. The grant to be made in respect of any course, in accordance with the foregoing regulations, may, in exceptional cases, be increased by one-tenth when the Inspector is of opinion that the work is of conspicuous merit, and the grounds of such opinion shall be fully set forth in his report. It may also be reduced by one or more tenths on the ground of unsatisfactory work, or for defects of equipment or organization, or for any failure to meet the requirements of the foregoing articles which may tend to lessen the efficiency of the work done.

V. The whole grant earned by the school may be reduced by its excess (if any) over the income of the school, as a whole, from local sources (including income from rates, subscriptions, endowments, and contributions from Local Taxation Funds administered by various public bodies, but exclusive of income from fees).†

VI. It shall be a condition of grants, under this minute, that a fixed salary shall be paid to the teachers of the classes for which a grant is sought, either in respect of their work in these classes or their work in the school as a whole (but exclusive of any employment in evening classes held in the same or other schools), and any grants received shall be paid into the School Account, and be used by managers for improving the efficiency of the school.

VII. Existing Schools of Science shall have the option of obtaining grants in respect of the Session 1900-1901, either under this Minute or under the provisions of Section LVI. *seq.* of the Science and Art Directory, but grants may not be claimed under both schemes in respect either of the same or of different sets of pupils in the same school.

* Eventually the possession of a degree in Science of some recognized University or Science College, granted upon a curriculum which ensures adequate experience of experimental work in Science, will be deemed a necessary qualification for teachers of Science in schools of this class to which grants are made.

† This condition will not be enforced in the case of existing Schools of Science in respect of any grant which may be conditionally due before the 1st of August, 1903.

DOCUMENTS, IV.

IV.

Documents put in by J. H. Reynolds, Esq., Director of the Municipal School of Technology, Manchester.

(1.)

RETURN prepared for the Association of Technical Institutions with Reference to the ATTENDANCE of STUDENTS at Technological Courses.

(See the evidence of Mr. J. H. REYNOLDS, q. 4584).

ASSOCIATION OF TECHNICAL INSTITUTIONS.

President.—The Right Hon. Sir WILLIAM HART-DYKE, Bart., M.P.

Hon. Secretary.—Prof. J. WERTHEIMER, B.SC., B.A., Merchant Venturers' Technical College, Bristol.

(1.) The Council begs to report that, in accordance with resolution 12 on page 27 of the last Proceedings of the Association, it has asked for the returns, a Summary of which is appended below.

(2.) All the Institutions composing the Association have sent in returns, with the exception of the Goldsmiths' Institute, London.

(3.) From the Summary it will be seen that a large number of Institutions not belonging to the Association have very kindly supplied the information for which we asked; the Council takes this opportunity of re-iterating its thanks to the officials of these Institutions who have so kindly filled in the returns sent to them, as well as to Dr. W. Garnett, the Secretary of the Technical Education Board of the London County Council, who has kindly supplied information as to the work of some Institutions in the metropolitan area; but the Council regrets that it has failed to obtain information from the following external Institutions:—Cirencester Royal Agricultural College; Downton College of Agriculture; Maynooth College; Queen's College, Belfast; Queen's College, Galway; Reading College; Royal Albert Memorial College, Exeter; Royal College of Science, London; United College of San Salvator and St. Leonard.

(4.) The Report of the Royal Colleges of Science, London, shows that during the Session 1899-1900 there were 71 students preparing for the Associateship in Mechanics, while 90 were preparing for the Associateship in Chemistry, 36 in Metallurgy, and 27 in Mining; these numbers are exclusive of occasional students studying in the same Departments.

(5.) The Council has appointed a Sub-Committee to draft a pamphlet dealing with the statistics contained in this Summary; it is hoped that this may be ready for issue at an early date.

A.—Return of *Day* Students, none of whom are under 15, who are taking complete regular Day Technological Courses. (The Institutions marked with an asterisk are not members of the Association).

TABLE I.

DAY STUDENTS WHO HAVE RECEIVED INSTRUCTION NOT LESS THAN TWENTY HOURS A WEEK.

NOTE.—In the Columns marked "A" those Students are entered who have had outside workshop experience or the equivalent (*e.g.* farming experience, &c.); in the columns marked "B" those Students who are simply continuing their education on specialised lines.

Town.	Institutions.	Number of individual Students in attendance at the end of May, 1901.							
		First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	(*a.*) AGRICULTURE.	A.	B.	A.	B.	A.	B.	A.	B.
†Aberdeen, ...	*University, ...	-	36	-	7	-	-	-	-
Aberystwyth, ...	*University College of Wales, ...	38	41	-	13	-	4	-	2
Aspatria, ...	*Agricultural College, ...	2	10	-	6	-	7	-	-
Bangor, ...	*University College of North Wales, ...	21	4	-	2	-	1	-	-
Edinburgh, ...	*University (*see footnote* 1, *page* 277), ...	-	-	-	-	-	4	-	-
†Glasgow, ...	*West of Scotland Agricultural College, ...	5	6	6	-	-	-	-	-
Leeds, ...	*Yorkshire College, ...	34	4	13	-	1	-	1	-
Newcastle-on-Tyne, ...	*Durham College of Science, ...	-	18	-	5	-	3	-	-
Preston, ...	Harris Institute (County School), ...	10	8	9	9	4	4	4	-
Uckfield, ...	*Agricultural and Horticultural College, ...	2	10	-	6	-	7	-	-
Wye, ...	*South Eastern Agricultural College, ...	-	17	3	19	-	5	-	-
	Totals, ...	112	154	31	67	5	35	5	2
	(*b.*) BREWING.								
Birmingham, ...	*University, ...	-	16	-	6	-	-	-	-
	(*c.*) BUILDING TRADES.								
Brighton, ...	Technical School, ...	-	3	-	-	-	1	-	-
Bristol, ...	Merchant Venturers' Technical College, ...	1	3	-	2	-	-	-	1
London, ...	Battersea Polytechnic, ...	-	4	-	-	-	-	-	-
Do., ...	*King's College, ...	-	7	-	1	-	-	-	-
Do., ...	Regent Street Polytechnic, ...	-	15	-	6	-	1	-	-
Salford, ...	Royal Technical Institute, ...	-	-	-	1	-	-	-	-
West Ham, ...	Municipal Technical Institute, ...	-	2	-	-	-	-	-	-
	Totals, ...	1	34	-	10	-	2	-	1
	(*d.*) BAKERY AND CONFECTIONERY.								
London, ...	Borough Polytechnic Institute, ...	19	-	-	-	-	-	-	-

†The numbers for these Institutions do not refer to the end of May, 1901, but to the period of their Sessions nearest that time.

Town.	Institutions.	Number of individual Students in attendance at the end of May, 1901.							
		First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	(e.) CHEMISTRY (APPLIED), INCLUDING DYEING, METALLURGY, &C.	A.	B.	A.	B.	A.	B.	A.	B.
Birmingham,	*University,	-	7	-	4	-	3	-	6
Bradford,	Municipal Technical College,	3	15	-	13	-	6	-	-
Bristol,	Merchant Venturers' Technical College,	-	14	-	3	-	4	-	3
Do.,	*University College,	-	1	-	1	-	-	-	-
Derby,	Municipal Technical College,	-	2	-	2	-	1	-	-
Glasgow,	G. and West of Scotland Technical College,	3	35	-	17	-	14	1	9
Huddersfield,	Technical College,	-	4	-	3	-	2	-	-
Hull,	Municipal Technical School,	-	2	-	1	-	-	-	1
Leeds,	*Yorkshire College,	-	24	-	6	-	3	-	-
Liverpool,	*University College,	-	2	-	2	-	8	-	-
London,	Battersea Polytechnic,	-	-	-	1	-	-	-	-
Do.,	Birkbeck Institute,	-	9	-	-	-	-	-	-
Do.,	East London Technical College,	-	8	-	7	-	1	-	-
Do.,	*King's College,	-	21	-	5	-	7	-	-
Do.,	Regent Street Polytechnic,	-	43	-	17	-	1	-	-
Do.,	South Western Polytechnic,	-	3	-	3	-	1	-	-
Manchester,	Municipal School of Technology	-	15	-	15	-	8	-	-
Do.,	*Owens College (*see footnote* 3, *page* 277),	-	35	-	55	-	23	-	-
Newcastle-on-Tyne,	*Durham College of Science,	-	-	-	13	-	11	-	2
Nottingham,	*University College,	-	5	-	5	-	4	-	2
Salford,	Royal Technical Institute	-	3	-	3	-	2	-	-
Sheffield,	University College,	-	8	-	3	-	2	-	-
Swansea,	Municipal Technical School,	-	-	-	4	-	1	-	-
West Ham,	Municipal Technical School,	-	2	-	1	-	-	-	-
Wye,	*South Eastern Agricultural College,	2	-	-	-	-	-	-	-
	Totals,	8	258	-	184	-	102	1	23
†London,	*City and Guilds Central Technical College,	8		5		7		‡25	
Do.,	City and Guilds Technical College, Finsbury,	18		9		19		-	
	Totals,	26		14		26		25	
	(f.) ENGINEERING.								
Bangor,	*University College of North Wales,	1	2	-	3	-	1	-	-
Birmingham,	*University,	-	26	-	15	-	7	-	-
Bolton,	Municipal Technical School,	-	15	-	-	-	-	-	-
Bradford,	Municipal Technical College,	-	34	-	40	1	20	-	-
Brighton,	Technical School,	3	16	2	10	-	4	-	-
Bristol,	Merchant Venturers' Technical College,	5	25	-	12	-	7	-	-
Do.,	*University College,	-	24	2	11	1	2	-	-
Cambridge,	*University (*see footnote* 5, *page* 277),	-	55	-	40	-	27	-	-
Cardiff,	*University College,	-	9	-	8	-	1	-	4
Cooper's Hill,	*Royal Indian Engineering College,	1	37	-	32	1	27	-	-
Derby,	Municipal Technical College,	-	4	-	5	-	-	-	-
Dublin,	*Trinity College,	-	17	-	10	-	13	-	-
Dundee,	*University College,	5	4	3	3	1	3	-	-
Edinburgh,	Heriot-Watt College,	-	47	-	18	-	-	-	-
Do.,	*University (*see footnote* 1, *page* 277),	1	4	-	-	3	7	-	-
Glasgow,	G. and West of Scotland Technical College,	12	29	6	8	1	6	1	-
Do.,	*University (*see footnote* 2, *page* 277),	22	5	18	8	11	3	9	5
Huddersfield,	Technical College,	-	9	-	4	-	2	-	-
Hull,	Municipal Technical School,	1	16	-	8	-	4	-	-
Leeds,	*Yorkshire College,	22	27	7	13	6	6	-	-
Leicester,	Municipal Technical School,	-	7	-	1	-	-	-	-
Liverpool,	*University College,	-	41	-	44	-	23	-	-
London,	Battersea Polytechnic,	-	15	-	2	-	1	-	-
Do.,	Carriage Building School,	8	-	2	-	2	-	-	-
Do.,	East London Technical College,	-	16	-	6	-	1	-	-
Do.,	*King's College,	-	59	-	28	-	23	-	2
Do.,	Regent Street Polytechnic,	-	43	-	17	-	1	-	-
Do.,	South Western Polytechnic,	-	16	-	11	-	9	-	-
Do.,	*University College,	-	46	-	41	-	11	-	3
Manchester,	Municipal School of Technology,	1	46	-	26	-	-	-	-
Do.,	*Owens College (*see footnote* 3, *page* 277),	1	36	-	19	-	16	1	2
Newcastle-on-Tyne,	*Durham College of Science,	2	20	3	12	4	-	-	-
Nottingham,	*University College,	-	26	-	21	-	9	-	-
Oxford,	*University (*see footnote* 4, *page* 277),	-	20	-	-	-	-	-	-
Penge,	*Crystal Palace Engineering School,	-	37	-	38	-	10	-	1
Preston,	Harris Institute,	-	4	-	-	-	-	-	-
Salford,	Royal Technical Institute,	-	7	-	6	-	7	-	-
Sheffield,	University College,	2	20	1	10	-	6	-	1
Southampton,	Hartley College,	1	16	-	7	-	2	-	-
Swansea,	Municipal Technical School,	-	2	-	-	1	2	-	-
West Ham,	Municipal Technical Institute,	1	4	-	1	-	-	-	-
	Totals,	89	886	44	538	32	261	11	18
†London,	*City and Guilds Central Technical College,	90		72		54		‡23	
Do.,	*City and Guilds Technical College, Finsbury,	76		65		-		-	
	Totals,	166		137		54		2	
	(g.) FORESTRY.								
Cooper's Hill,	*Royal Indian Engineering College,	-	10	-	9	-	6	-	-
	(h.) LEATHER INDUSTRIES.								
Leeds,	*Yorkshire College,	4	5	-	1	2	-	-	-
London,	Borough Polytechnic (Herold's Institute),	5	-	3	-	-	-	-	-
	Totals,	9	5	3	1	2	-	-	-
	(i.) MINING.								
Camborne,	*Mining School,	24	77	1	18	-	6	-	-
Cardiff,	*University College,	-	7	-	2	-	2	-	4
Glasgow,	G. and West of Scotland Technical College,	-	6	-	2	-	1	-	-
Newcastle-on-Tyne,	*Durham College of Science,	-	4	-	6	-	6	-	-
	Totals,	24	94	1	28	-	15	-	4

† These two Institutions do not specify which of their Students have had outside workshop experience.
‡ Special Students, including post graduates and research Students.

DOCUMENTS, IV.

Town.	Institutions.	Number of individual Students in attendance at the end of May, 1901.							
		First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	(*j.*) NAVAL ARCHITECTURE.								
Glasgow, ...	G. and West of Scotland Technical College, ...	1	2	-	1	-	-	-	-
Do., ...	*University (*see footnote* 2, *page* 277), ...	13	3	4	-	2	-	-	-
Newcastle-on-Tyne, ...	*Durham College of Science, ...	-	4	2	-	1	-	-	-
	Totals.	14	9	6	1	3	-	-	-
	(*k.*) NAVIGATION.								
Bristol, ...	Merchant Venturers' Technical College, ...	-	39	-	-	-	-	-	-
Liverpool, ...	*Nautical College, ...	-	46	-	-	-	-	-	-
	Totals, ...	-	85	-	-	-	-	-	-
	(*l.*) TELEGRAPHY.								
Cooper's Hill, ...	*Royal Indian Engineering College, ...	-	-	-	5	-	-	-	-
	(*m.*) TEXTILE INDUSTRIES.								
Blackburn, ...	Municipal Technical School, ...	-	-	1	-	-	-	-	-
Bolton, ...	Municipal Technical School, ...	-	6	-	2	-	-	-	-
Bradford, ...	Municipal Technical College, ...	-	11	-	16	-	4	-	-
Coventry, ...	Municipal Technical Institute, ...	6	-	-	-	-	-	-	-
Halifax, ...	Municipal Technical School, ...	-	3	-	-	-	-	-	-
Huddersfield, ...	Technical College, ...	-	7	-	3	-	3	-	-
Leeds, ...	*Yorkshire College, ...	13	5	8	3	4	1	-	-
Manchester, ...	Municipal School of Technology, ...	-	10	-	7	-	-	-	-
	Totals, ...	19	42	9	31	4	8	-	-

TABLE II.

DAY STUDENTS WHO HAVE RECEIVED INSTRUCTION LESS THAN TWENTY HOURS A WEEK.

NOTE.—In the columns marked "A" those Students are entered who have had outside workshop experience (or the equivalent; in the columns marked "B" those Students who are simply continuing their education on specialised lines.

Town.	Institutions.	Number of individual Students in attendance at the end of May, 1901.							
		First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	(*a.*) AGRICULTURE.	A	B	A	B	A	B	A	B
Uckfield, ...	*Agricultural College, ...	2	2	2	2	-	-	-	-
	(*b.*) BREWING.								
Birmingham, ...	*University, ...	-	4	-	-	-	-	-	-
	(*c.*) BUILDING TRADES.								
Brighton, ...	Municipal School of Science, ...	-	3	-	-	-	-	-	-
Bristol, ...	Merchant Venturers' Technical College, ...	-	9	-	-	-	-	-	-
Glasgow, ...	G. and West of Scotland Technical College, ...	3	4	1	-	-	-	-	-
Huddersfield, ...	Technical College, ...	-	4	-	3	-	-	-	-
Leicester, ...	Municipal Technical School, ...	-	5	-	-	-	-	-	-
London, ...	Battersea Polytechnic, ...	-	-	1	1	-	-	-	-
Do., ...	Regent Street Polytechnic, ...	140	-	25	-	8	-	-	-
Do., ...	*University College, ...	-	14	-	-	-	-	-	-
Manchester, ...	Municipal School of Technology, ...	-	12	-	3	-	-	-	-
Nottingham, ...	*University College, ...	3	-	3	-	-	-	-	-
	Totals, ...	146	51	30	7	8	-	-	-
	(*d.*) CHEMISTRY (APPLIED), INCLUDING DYEING, METALLURGY, &C.								
Blackburn, ...	Municipal Technical School, ...	-	-	-	2	-	-	-	-
Bradford, ...	Municipal Technical College, ...	4	-	4	-	-	-	-	-
Bristol, ...	Merchant Venturers' Technical College, ...	-	-	-	1	-	1	-	5
Do., ...	*University College, ...	-	16	-	6	-	7	-	3
Derby, ...	Municipal Technical College, ...	1	-	3	-	-	-	-	-
Glasgow, ...	G. and West of Scotland Technical College, ...	7	25	-	2	-	-	-	-
Huddersfield, ...	Technical College, ...	-	5	1	4	-	3	-	-
Hull, ...	Municipal Technical School, ...	-	11	3	-	-	-	-	-
Leeds, ...	*Yorkshire College, ...	-	-	1	-	-	-	-	-
Leicester, ...	Municipal Technical School, ...	-	6	-	2	-	-	-	-
Liverpool, ...	*University College, ...	1	7	-	2	-	4	-	-
London, ...	Battersea Polytechnic, ...	-	11	-	1	-	-	-	-
Do., ...	*King's College, ...	-	3	-	-	-	-	-	-
Do., ...	South Western Polytechnic, ...	-	16	-	2	-	-	-	-
Manchester, ...	Municipal School of Technology, ...	1	20	-	2	-	2	-	-
Do., ...	*Owens College, ...	-	90	-	-	-	-	-	-
Nottingham, ...	*University College, ...	7	-	-	-	-	-	-	-
Preston, ...	Harris Institute, ...	-	4	-	2	-	-	-	-
Rochdale, ...	Municipal Technical School, ...	3	1	-	1	-	-	1	-
Sheffield, ...	University College, ...	2	10	1	-	-	1	-	-
Swansea, ...	Municipal Technical School	-	2	-	8	-	5	-	-
	Totals, ...	26	227	13	35	-	23	1	8

Town.	Institutions.	Number of individual Students in attendance at the end of May, 1901.							
		First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	(*e.*) ENGINEERING.	A.	B.	A.	B.	A.	B.	A.	B.
Bangor, ...	*University College, ...	1	2	-	3	-	1	-	-
Birmingham, ...	*University, ...	-	3	-	-	-	-	-	-
Bolton, ...	Municipal Technical School, ...	-	1	-	-	-	-	-	-
Brighton, ...	Municipal School of Science, ...	-	7	-	-	-	-	-	-
Bristol, ...	*University College, ...	1	1	-	-	-	-	-	-
Cambridge, ...	*University (*see footnote* 5), ...	-	-	-	7	-	20	-	-
Cork, ...	*Queen's College, ...	-	5	-	7	-	5	-	-
Derby, ...	Municipal Technical College, ...	6	-	9	-	-	-	-	-
Dundee, ...	*University College, ...	-	4	2	-	-	-	-	-
Edinburgh, ...	*University, ...	-	-	10	1	-	-	-	
Glasgow, ...	G. and West of Scotland Technical College, ...	96	27	14	1	6	-	8	-
Do., ...	*University (*see footnote* 2), ...	6	-	-	1	-	-	-	-
Hull, ...	Municipal Technical School, ...	3	-	1	-	2	-	-	-
Leeds, ...	*Yorkshire College, ...	1	-	-	-	-	-	-	-
London, ...	Battersea Polytechnic, ...	2	5	-	-	-	1	-	-
Do., ...	*King's College, ...	-	6	-	-	-	-	-	-
Manchester, ...	Municipal School of Technology, ...	-	8	-	1	1	-	-	-
Nottingham, ...	*University College, ...	4	1	4	-	-	-	-	-
Salford, ...	Municipal Technical Institute, ...	-	2	-	1	-	-	-	-
Sheffield, ...	University College, ...	11	3	2	-	1	1	-	-
Swansea, ...	Municipal Technical School, ...	-	-	2	-	-	-	-	-
	Totals, ...	131	75	44	22	10	28	8	-
	(*f.*) HOSIERY.								
Leicester, ...	Municipal Technical School, ...	-	2	-	-	-	-	-	-
	(*g.*) LEATHER INDUSTRIES.								
London, ...	Borough Polytechnic, ...	3	1	-	-	-	-	-	-
	(*h.*) MINING.								
Leeds, ...	*Yorkshire College, ...	12	-	20	-	-	-	-	-
Glasgow, ...	G. and West of Scotland Technical College, ...	2	6	1	-	-	-	-	-
Sheffield, ...	University College, ...	2	1	1	-	-	1	-	-
	Totals, ...	16	7	22	-	-	1	-	-
	(*i.*) NAVAL ARCHITECTURE.								
Glasgow, ...	*University (*see footnote* 2), ...	6	2	-	-	1	-	1	-
	(*j.*) PRINTING TRADES.								
London, ...	St. Bride Foundation Institute, ...	39	-	-	-	-	-	-	-
	(*k.*) TEXTILE INDUSTRIES.								
Bolton, ...	Technical School, ...	-	2	-	-	-	-	-	-
Huddersfield, ...	Technical College, ...	4	3	2	2	1	1	-	-
Leeds, ...	*Yorkshire College, ...	6	5	-	1	-	-	-	-
Manchester, ...	Municipal School of Technology, ...	-	4	-	2	-	-	-	-
	Totals, ...	10	14	2	5	1	1	-	-
	(*l.*) WATCHMAKING.								
Coventry, ...	Municipal Technical Institute, ...	20	-	-	-	-	-	-	-

NOTES.

1.—EDINBURGH UNIVERSITY.—From the lists supplied by the University authorities it appears that Engineering and Agriculture are the only two subjects in which complete regular Technological Courses of study are provided at this University; the information supplied has been prepared by the Professor of Engineering.

2.—GLASGOW UNIVERSITY.—This information has been supplied by the Professors of Engineering and of Naval Architecture: from the class lists supplied by the Clerk of the Senate it appears that the courses in these two subjects are the only complete regular Technological Courses conducted by the University.

3.—MANCHESTER, OWENS COLLEGE.—The forms sent to this College were forwarded by the Principal to the Professors of Engineering and Chemistry, who have supplied the information given.

4.—OXFORD UNIVERSITY.—It appears that the only Technological work at present done in connection with the University is in the Millard Mechanical Engineering Laboratory. There were, on the 1st June, 1901, 20 Students working in this Laboratory 28 hours per week.

5.—CAMBRIDGE UNIVERSITY.—This information has been supplied by Professor Ewing.

[SUMMARY.

TABLE III.

SUMMARY OF THE ABOVE.

*DAY STUDENTS WHO HAVE RECEIVED INSTRUCTION NOT LESS THAN TWENTY HOURS A WEEK.

Courses.	First Year Students.		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	A.	B.	A.	B.	A.	B.	A.	B.
Agriculture,	112	154	31	67	5	35	5	2
Brewing,	-	16	-	6	-	-	-	-
Building Trades,	1	34	-	10	-	2	-	1
Bakery and Confectionery,	19	-	-	-	-	-	-	-
*Chemistry (Applied) including Dyeing, Metallurgy, &c.,	8	258	-	184	-	102	1	23
†Engineering,	89	886	44	538	32	261	11	18
Forestry,	-	10	-	9	-	6	-	-
Leather Industries,	9	5	3	1	2	-	-	-
Mining,	24	94	1	28	-	15	-	4
Naval Architecture,	14	9	6	1	3	-	-	-
Navigation,	-	35	-	-	-	-	-	-
Telegraphy,	-	-	-	5	-	-	-	-
Textile Industries,	19	42	9	31	4	8	-	-
	295	1,598	94	880	46	429	17	48
	1,893		974		475		65	
*Chemistry (Applied) additional,	26		14		26		25	
†Engineering, additional,	166		137		54		23	
Totals,	2,080		1,125		555		113	

DAY STUDENTS WHO HAVE RECEIVED INSTRUCTION LESS THAN TWENTY HOURS A WEEK.

Courses	First Year Students		Second Year Students.		Third Year Students.		Students who have attended more than 3 full years.	
	A.	B.	A.	B.	A.	B.	A.	B.
Agriculture,	2	2	2	2	-	-	-	-
Brewing,	-	4	-	-	-	-	-	-
Building Trades,	146	51	30	7	8	-	-	-
Chemistry (Applied) including Dyeing, Metallurgy, &c.,	26	227	13	35	-	23	1	8
Engineering,	131	75	44	22	10	28	8	-
Hosiery,	-	2	-	-	-	-	-	-
Leather Industries,	3	1	-	-	-	-	-	-
Mining,	16	7	22	-	-	1	-	-
Naval Architecture,	6	2	-	-	1	-	1	-
Printing Trades,	39	-	-	-	-	-	-	-
Textile Industries,	10	14	2	5	1	1	-	-
Watchmaking,	20	-	-	-	-	-	-	-
	399	385	113	71	20	53	10	8
Totals,	784		184		73		18	

TABLE IV.

The following Institutions have at present no Day Classes for Students over 15 who are taking complete regular Day Technological Courses; they have, however, in some cases "Schools of Science"—see B, page 47.

Aberdeen, ... Robert Gordon's College.
Ashton-under-Lyne, ... Heginbotham Technical School and Free Library.
Bath, ... Municipal Technical School.
Belfast, ... Municipal Technical Institute.
Birkenhead, ... Schools of Science and Art.
Birmingham, ... Municipal Technical School.
Burnley, ... Mechanics' Institute.
Bury, ... Technical School.
Cambridge, ... Municipal Technical Institute.
Cardiff, ... Municipal Technical School.
Darwen, ... Municipal Technical School.
Dewsbury, ... Technical School.
Dublin, ... *City of Dublin Technical School.
Do., ... *University College.
Keighley, ... Technical Institute.
Leeds, ... School of Science and Technology.
Lincoln, ... Municipal Technical School.
Liverpool, ... School of Science, Technology, and Art.
London, ... *Camberwell School of Arts.
Do., ... *Central School of Arts and Crafts.
Do., ... City of London College.
London, ... *Hackney Institute.
Do., ... *Leather Trades' School.
Do., ... Northern Polytechnic Institute, Holloway.
Do., ... *School of Economics and Political Economy.
Do., ... *Shoreditch Technical Institute.
Do., ... Wandsworth Technical Institute.
Do., ... *Westbourne Park Institute.
Do., ... *Westminster Technical Institute.
Do., ... Woolwich Polytechnic Institute.
Longton, ... Sutherland Technical Institute.
Newcastle-on-Tyne, ... Rutherford College.
Northampton, ... Technical School.
Oldham, ... Municipal Technical School.
Paisley, ... Technical School.
Plymouth, ... Science, Art, and Technical Schools.
Portsmouth, ... Municipal Technical Institute.
St. Helens, ... Gamble Institute.
Stockport, ... Technical Institute.
Swindon, ... Technical School.
Taunton, ... *Municipal Technical Institute.
West Bromwich, ... Municipal Technical Institute.
Wolverhampton, ... Science and Technical School.

NOTE.—At the Northampton Institute, London, some Engineering Day Classes were held in the Session 1900-1; full courses will be opened next Session.

TABLE V.

B.—Return of Number of Pupils, whether more or less than 15 years old, enrolled in a "School of Science" connected with the Board of Education, and held in one of the constituent Institutions of the Association.

Town.	Institution.	First Year.	Second Year.	Third Year.
Aberdeen,	(a) Robert Gordon's College,	127	100	55
Bath,	Technical School,	73	43	13
Birmingham,	Municipal Technical School,	69	67	32
Blackburn,	Municipal Technical School,	58	26	15
Bristol,	Merchant Venturers' Technical College (Boys' School),	147	92	46
Cambridge,	(b) Technical Institute (The County School),	134	22	-
Darwen,	(c) Science, Art, and Technical School,	45	14	10
Glasgow,	G. and W. of Scotland Technical College (Allan Glen's School),	206	161	89
Huddersfield,	Technical College,	23	21	9
Hull,	(d) Municipal Technical School,	53	37	11
Keighley,	Technical Institute,	57	53	31
Leeds,	Institute of Science, Art, and Literature,	169	92	52
Lincoln,	Municipal Technical School,	24	19	10
London,	Battersea Polytechnic,	97	27	46
Do.,	Borough Polytechnic,	72	35	4
Do.,	East London Technical College,	268	169	81
Do.,	Regent Street Polytechnic,	180	93	56
Do.,	South-Western Polytechnic,	97	51	44
Do.,	Wandsworth Technical Institute,	88	34	12
Do.,	Woolwich Polytechnic Institute,	73	-	-
Longton,	Sutherland Technical Institute,	15	7	-
Newcastle-on-Tyne,	Rutherford College,	137	81	33
Plymouth,	(e) Science, Art, and Technical School,	-	-	10
Stockport,	Technical Institute,	60	25	6
	Totals,	2,322	1,269	665

(a.) The numbers given are exclusive of 27 new boys, for whom a special course combining first and second years' work was provided.
(b.) School newly started.
(c.) Held in the School, but under the management of the School Board.
(d.) Not a School of Science, but is a branch of the Institution corresponding to a School of Science.
(e.) There are also 70 first and second year Students taken at the Higher-Grade Board School.

J. WERTHEIMER, *Hon. Sec.*

Merchant Venturers' Technical College,

Bristol, *7th November*, 1901.

(2.)

REPORT of the SUB-COMMITTEE appointed to consider the question of the ORGANISATION of the MUNICIPAL TECHNICAL SCHOOL of MANCHESTER on its establishment in the NEW BUILDINGS in SACKVILLE-STREET, MANCHESTER.

(See the Evidence of Mr. J. H. REYNOLDS, q. 4364.)

TECHNICAL INSTRUCTION.

The Special Committee *re* Technical Instruction Acts present to the Council the following report:—

At the meeting of your Committee held on the 21st February, 1901, a Sub-Committee was appointed to deal with the Organisation, including the Staff, of the new Technical School.

The Sub-Committee have had a number of meetings, and at the meeting of the General Committee on the 20th May, 1901, they presented the accompanying report, which, with its several recommendations, was then approved, and is now recommended to the Council for adoption.

On behalf of the Committee,

(Signed) JAMES HOY,
Chairman.

Town Hall, Manchester,
20th May, 1901.

Report of the Sub-Committee appointed to consider the question of the Organisation of the Municipal Technical School on its Establishment in the New Building in Sackville-street.

Sub-Committee.

The Sub-Committee comprised Alderman Hoy (the Chairman), Councillor Wilson (the Deputy-Chairman), Councillors Shann, Brocklehurst, Plummer, Fildes, Messrs. Donner, Godlee, Lee, Levinstein, Nasmith, Rowley, and Simpson.

Tentative Report

A tentative report of thirty-seven octavo pages, prepared by the Director (Mr. Reynolds), has received most careful consideration at the meetings of the Sub-Committee, and their conclusions and recommendations thereon are now submitted in the form of a succinct, final report, with appendices, for the approval of the General Committee.

Organisation a matter of urgency.

It will be agreed that it is a matter of the highest importance that the organisation of the New School, in view of the early occupation of the building, should be considered and determined without delay.

The extremely important character of the equipment in all departments, the much higher range of instruction which is thus possible, the more advanced age and the better educational condition of the future day student which these conditions will demand, and the much more important service which the School will now be able to render to the industries of the district, especially in the education of men who have had a period of training in the works, make it highly desirable that the organisation of the School, and the means of making it efficient for its purpose, should receive careful attention.

Suggested change in the title of the School.

Having regard to the enhanced status of the School, and with the purpose of expressing exactly and significantly its precise scope and aims, the Sub-Committee recommend that the School be described by a new title, namely, "THE MUNICIPAL SCHOOL OF TECHNOLOGY, MANCHESTER." It will not be doubted that there is no institution in the United Kingdom which will be better, if as well, equipped for the purposes of technological training, instruction, and research.

Character of the teaching staff.

It therefore follows that the staff, and especially the heads of departments, must be men who, by their attainments, technical experience, and aptness to teach, will command the respect and sympathy of employers and managers engaged in the industries with which the School is concerned. They must moreover, be men able to put the costly equipment to the fullest use, and to pursue by its aid technical investigations for the advancement of industrial methods and enterprise; and further, the educational status of the chief members of the staff must be such as to place them on an equality with men occupying like positions in University Colleges.

Constitution of the teaching staff.

The Sub-Committee are of opinion that such attainments and such experience demand suitable recognition, and they therefore recommend for the due constitution of the teaching staff the establishment of the following grades:—

1st. Professors or Directors (who would be Heads of the more important Departments).

2nd. Assistant Professors (responsible for important sections of a department).

3rd. Lecturers (appointed for selected courses).

4th. Instructors (appointed to the workshops and the drafting rooms).

5th. Demonstrators (appointed as assistants in the lecture rooms and laboratories).

Principal and Vice-Principal

They further recommend, with a view to the efficient administration of the School, that the Director of Technical Instruction be the Principal, and the Assistant Director the Vice-Principal of the School.

Board of Studies.

The Sub-Committee recommend that the Board of Studies—to which body will be committed, subject to the approval of the General Committee, the arrangement and correlation of the studies of the School; the arrangement, subjects, and conduct of the Entrance, Term, and Final Examinations; the admission of students; and the scholastic discipline of the School—be composed of the Principal, Vice-Principal, and the Professors or Directors aforesaid, with such other Assistant Professors as the Committee may designate.

Award of diplomas.

The Sub-Committee are strongly of opinion that, with the purpose of placing the instruction and training of the School on a satisfactory level, it is desirable to establish a scheme of diplomas to be awarded to day students who go through a regular and systematic course of three years, or other approved period of continued study, and also to evening students who accomplish the same end, but over a longer period of time.

Conditions of award.

They recommend accordingly the award of a diploma, determined by a final examination conducted by the Professors and Lecturers of the School associated with External Examiners.

Title attached to the diploma

This diploma should carry with it the title of Associate of the Municipal School of Technology, Manchester.

Principle of administration.

In the opinion of this Committee the cardinal principle to be observed in the due administration of the School in all its aspects is that of the devolution of duties distributed in departments or sections, each controlled by a capable chief directly responsible to the Principal, and, in his absence, to the Vice-Principal.

Two chief divisions of the School.

The work of the School falls naturally into two chief divisions, namely:—

I. TEACHING.

II. ADMINISTRATION.

The Sub-Committee in respect of the first of these divisions have had under careful consideration the subjects which should be included within the sphere of instruction and training contemplated by the School.

Varied nature of the School courses.

The wide range and great importance of the industries and the extensive commerce carried on in the densely populated district of which Manchester is the business centre naturally require that the School provide instruction of a most varied character.

Costly character of the equipment and staff.

The more important of these industries demand, in order that the training in respect of them may be efficient, a large and costly equipment and a highly-qualified teaching staff.

Age limit and entrance examination.

With a view to the selection of suitable students, a minimum age limit of 15 years is fixed with an entrance examination to be passed by all students seeking admission to the regular courses.

Preparatory course necessary.

Experience has shown that many candidates who present themselves for this examination are unable to fulfil its not too onerous conditions, and such students have hitherto been offered a preparatory course of one year in subjects of a general character.

It is now recommended that this preparatory course shall be continued, not necessarily as a permanent feature of the School, but so long as the present unsatisfactory condition of secondary education demands it.

Day and evening instruction.

Whilst recognising that evening instruction under the economic conditions which prevail in English commercial and industrial life must continue to form a most important feature of the School, yet the Sub-Committee is convinced that the establishment and vigorous development of courses of instruction and training for suitably prepared day students who wish to fit themselves ultimately to occupy responsible commercial and industrial positions are a vital necessity, and must form an essential part of the School work.

Some subjects of instruction would of necessity be offered to evening students only; whilst others, those concerned with the great industries, would be arranged for both day and evening students. The Sub-Committee confidently expect that, when the equipment and staffing of the School is fully understood, many men will resort to it in the daytime who have already had works' experience.

Departments of instruction.

The departments of instruction for day students will fall under the following heads, each with a responsible director. Instruction in these subjects will also be available for evening students:—

A. Preparatory.
B. Mathematics.
C. Physics (including Electrical Engineering).
D. Engineering, sub-divided as follows:—
   1. Mechanical and Hydraulic.
   2. Electrical.
   3. Chemical.
   4. Municipal (including Sanitary and other branches of Engineering).
E. Chemistry (including Applied Chemistry).
F. Applied Chemistry, sub-divided as follows:—
   1. Tinctorial Chemistry.
   2. Bleaching, Dyeing, Printing, and Finishing.
   3. Paper Manufacture.
   4. Brewing.
   5. Metallurgy.
   6. Electro-Chemistry and Electro-Metallurgy.
   7. Gas Manufacture.
   8. Photography.
   9. Bread Making.
G. Textile Manufacture.
H. Architecture, sub-divided as follows:—
   1. History and Principles of Architecture.
   2. Architectural Design.
   3. Building Trades.
   4. Surveying.
   5. Sanitation, Heating, Lighting, and Ventilation.
I. The Printing Industries.
   1. Bookbinding.
   2. Letterpress Printing.
   3. Lithography.
   4. Photo Engraving, Wood Engraving, Collotype, and other important surface processes for producing and printing illustrations.

J. Women's Work.

1. Dressmaking and Cutting-out.
2. Needlework.
3. Millinery.

Additional evening courses of instruction.

The following additional courses of instruction will be provided for evening students:—

K. Natural Science.

1. Microscopy.
2. Botany.
3. Geology.
4. Mineralogy.
5. Physiography.
6. Physiology.
7. Hygiene.

L. Elementary Art.

M. Miscellaneous, including—

1. Rail and Road Carriage Building.
2. Milling (Flour Manufacture).
3. Horse Shoeing.
4. Tailors' Cutting.
5. First Aid to the Injured for Industrial Students.

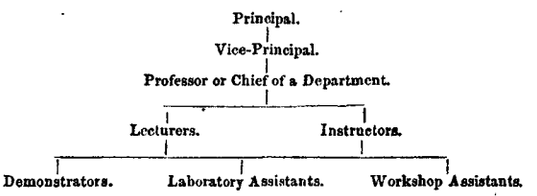
Personnel of teaching staff.

The corps of instructors and assistants of various grades in the principal departments will comprise:—

1. The Professor or Director of the Department.
2. The Lecturers responsible for each important section, who would be under the direction of the chief of the department.
3. The Instructors responsible for non-lecture subjects, such as drawing, tutorial work, laboratory, and workshop instruction.
4. The Demonstrators responsible for attendance upon the professor or the lecturer, for the preparation of the lecture table experiments, or other means of illustrating the lectures, and for assistance in tutorial and laboratory instruction.
5. Workshop and laboratory assistants responsible for the due care and preparation of apparatus, and for diagrams and stores.

Relation of the teaching staff to the Principal.

The following diagram indicates graphically the relation of the teaching staff to the Principal.



Heads of departments.

The following departments are already satisfactorily provided for in respect of the chief staff appointments:

Mathematics.
Mechanical Engineering.
Municipal, including Sanitary and other branches of Engineering.
Textile Manufacture.

With respect to Mechanical Engineering, it is recommended that Mr. Jordan, Assoc. R.C.S., Dublin, be appointed Assistant Professor of Engineering, with a seat on the Board of Studies.

Electrical Engineering.

The Department of Electrical Engineering presents under present circumstances some difficulty. It is absolutely necessary, in view of the great importance of the practical applications of electricity, that a gentleman of sound technical experience and training and of satisfactory theoretical attainments, in short an Electrical Engineer, be appointed, who should be styled Professor of Electrical Engineering. The Sub-Committee accordingly recommend such appointment.

The Sub-Committee recommend the appointment of Mr. W. W. Haldane Gee, B.SC., as Assistant Professor, who would have charge of the subject of Physics and such applications of it as may be arranged.

Pure and Applied Chemistry.

The Department of Pure and Applied Chemistry requires the appointment of a gentleman of first-rate attainments and administrative power, who should be held responsible for some one section, preferably Inorganic Chemistry, and for the effective organisation of the whole, and the Sub-Committee accordingly recommend such appointment. They further recommend that Dr. Edmund Knecht be appointed Assistant Professor of Chemistry, with a seat on the Board of Studies, and that Mr. Julius Hübner (in charge of the Dyeing, Printing, and Finishing House) be also given a seat on the Board of Studies.

Department for Architecture and the Building Trades.

The department of Architecture, which embraces courses of instruction in the History of Architecture, the principles and practice of architectural design, and for the constructional and artistic crafts associated with Architecture, requires for its successful management the appointment of a Director of high qualifications in respect of knowledge, experience, organising, and teaching capacity, who should be a man able to command the confidence of the profession. The number of the class entries in the Building Trades is 1,090, and, in addition, there are 62 persons engaged in Architectural pursuits studying Architecture at the Municipal School of Art. The Sub-Committee recommend such appointment.

Qualifications of Director.

Printing Industries.

A competent Director is required to take charge of the department devoted to the Printing Industries, under which head is included Letterpress Printing, Wood Engraving, Photo Engraving, Lithography, and Bookbinding. The Sub-Committee recommend that such appointment be made, the Director to take charge of some one complete section of the department, and be responsible for the whole.

Master of Design.

So much of the work of the School in certain sections is dependent upon effective training in the Arts of Design that the Sub-Committee recommend that a Master of Industrial Drawing and Design should be appointed.

Bread making and Confectionery.

In view of the decision of the General Committee to establish courses of instruction in Bread Making and Confectionery, it is recommended that a competent Instructor be appointed.

Newton Heath and Openshaw branch schools.

With the object of developing the Branch Schools at Newton Heath and Openshaw, the Sub-Committee recommend the appointment of a gentleman to act as Head of these establishments, which may readily under energetic and intelligent direction be made into successful subsidiary Technical Schools.

Appointments

If the foregoing recommendations are accepted, provision will have been made for the effective superintendence of the chief departments. Many other special and minor appointments will be necessary, but these will come before the Committee in due course; but it is absolutely necessary, in view of the early preparation of the Syllabus, that immediate steps be taken to make the important appointments above indicated.

Salaries.

The Committee suggest that the salaries now paid in each department be considered and revised.

Conditions of engagement.

In Appendix A will be found suggestions and recommendations with respect to the terms, hours, and conditions of engagement, and to the duties required of the respective members of the staff.

Special lecture courses.

The Sub-Committee suggest the desirability of arranging for short courses of lectures by specialists, following on the lines of the Cantor lectures of the Society of Arts, in subjects of importance to commercial men and manufacturers, for which excellent provision is made in the New Building. They further recommend in connection with the various technical departments, courses of instruction in the Organisation and Economics of Industry.

Commercial instruction.

The establishment of a department of Commercial Instruction and Training for Day Students of 15 years and upwards, on lines analogous to the Departments of Applied Science, has engaged the attention of your Sub-Committee. They hope shortly to be prepared with distinct recommendations on the subject.

Visiting committees.

It is suggested for the consideration of the Committee that much advantage would accrue from the appointment of small visiting Committees composed of well-known members of the respective trades and industries for each of the principal departments, and in some instances for particular industries. Their special knowledge and experience would be of great value in maintaining the departments at a high level of efficiency, and they would be a bond of sympathy and a medium between the School and the industries. Periodical meetings of these Committees could be arranged, reports presented, and recommendations made to the General Committee.

Testing and Technological investigations

The School will be in a specially favourable position to deal with Mechanical, Hydraulic, Electrical, Chemical, Textile, and many other forms of industrial testing, for which the public concerned will pay suitable fees. If this work is to be done satisfactorily and efficiently the intelligent and sympathetic interest of the teaching staff must be engaged. Some of the most valuable work of which the School is capable can be done in this way with the aid of its fine equipment

Documents, IV.

Not only will the best interests of the industries be materially advanced and served by these tests and investigations, but, hardly less important, the teaching staff will be kept in touch with actual industrial conditions, which will impart reality to their teaching, and in addition the students will themselves gain most materially from participation in the investigation and solution of practical problems, since their intelligence and scientific interest will be keenly aroused, and they will enjoy the satisfaction of seeing the knowledge and aptitude they have gained put to actual use.

As the testing and investigations for the public must, generally speaking, be carried out in time which is in excess of that agreed upon with the staff, it would seem not only proper but expedient that the teacher should receive such share in the fees derived therefrom as the Committee may arrange. There is nothing whatever novel in this, and under judicious regulations it would be productive of nothing but good to the School and to the public.

The Sub-Committee recommend that steps be taken to give effect to these suggestions.

Scale of Fees. The Sub-Committee having considered the Scale of Fees for the various courses and classes, is of opinion that they need revision, with a view to increased fees in some instances.

New Appointments. The recommendations of the Sub-Committee with respect to new appointments are summarised as follows:

Professor of Electrical Engineering.
Professor of Chemistry.
Director of Architecture.
Master of Design.
Director of the Printing Trades.
Instructor in Bread Making.

II.—Administrative Division.

Administration. The second of the two chief divisions named above will comprise five main departments, upon the effective staffing of which will depend to a large extent the successful working of the School.

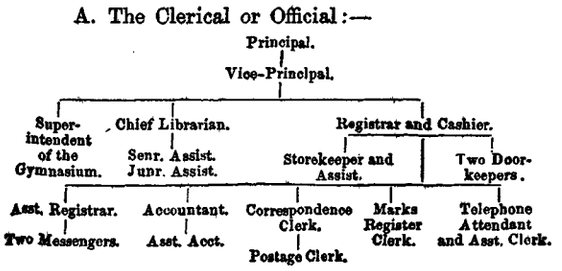
These departments comprise:—

A. The Clerical or Official (including the Library and the Gymnasium).
B. The Domestic.
C. The Restaurant.
D. Lighting and Power.
E. Heating, Ventilation, and Mechanical Equipment.

Relation of staff to the Principal. The following diagrams set forth the staff required to equip the aforesaid departments, and show the relation of the staff to the Principal and Vice-Principal in each case:—

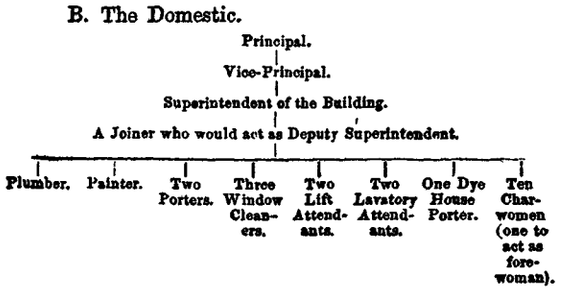
Clerical.

A. The Clerical or Official:—



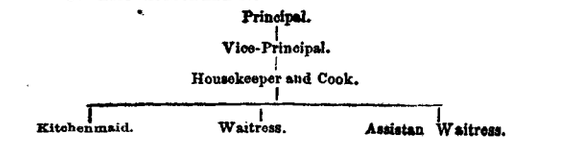
Domestic.

B. The Domestic.



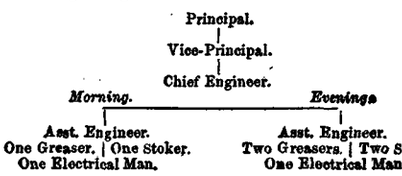
Restaurant.

C. The Restaurant.



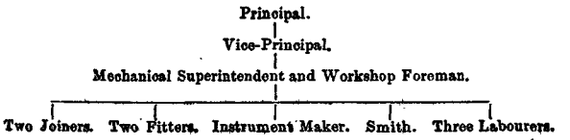
D. Lighting and Power.

Lighting and Power.



E. Heating and Ventilation, and Mechanical Equipment.

Heating and Ventilation.



And all other workmen employed in the School with the exception of those named above.

In Appendix C will be found a summarised list of the Administrative Staff required.

Appointments recommended. The Sub-Committee recommend the appointment of the following new principal officials, whose duties, except in the case of the Superintendent of the Building, the Storekeeper, the Housekeeper, and the Superintendent of the Gymnasium, should begin at the end of June. The exceptions named need not commence duty until September:—

Chief Librarian.
Superintendent of the Building.
Chief Engineer and the Assistant Engineer.
Mechanical Superintendent.
Housekeeper and Cook.
Superintendent of the Gymnasium.
Storekeeper.

Chief Librarian. The Chief Librarian should be a man of good education and scientific training, with some technical and industrial experience, and should be able to give valuable assistance to the teaching staff, the students, and the public on scientific and technical matters bearing upon commerce and industry. The Scientific and Technical Library will be a place of constant reference, not only by the staff and the student, but by the industrial and commercial public.

Superintendent of the Building. The maintenance of the Building in good order requires an efficient Superintendent who has a practical experience of building details, and who can effectively control a large number of subordinates. He would reside in the house arranged in the New Building, and would be free of rent, water, coal, gas, and electricity. The Superintendent would have oversight over all the buildings of the Committee so far as their efficient maintenance and good order are concerned. He would be responsible for the management, engagement, and dismissal of the domestic staff.

Chief Engineer and the Mechanical Superintendent. The Sub-Committee are satisfied that the foreman electrician for the distribution system and the foreman mechanical engineer now on the New Building may be confidently entrusted with the duties of Chief Engineer and Mechanical Superintendent respectively, and they are accordingly recommended for these positions.

Scheme of Hours and Duties. A scheme of hours and duties will be arranged with respect to the work of the various members of the Administrative Staff, and proper books of record kept where deemed necessary.

Uniforms. It is recommended that uniforms be provided for certain members of the Cleaning Staff and the Attendants.

Conditions of Appointment. In Appendix C will be found enumerated the principal recommendations of the Committee affecting the appointment of the Administrative Staff.

Re-appointment of Sub-Committee. The Sub-Committee ask for reappointment, with a view to deal with the important matters arising out of the Report.

(Signed) James Hoy,
Chairman.

May 13th, 1901.

APPENDIX A.

Conditions of Engagement of the Teaching Staff.

1. The principal members of the Teaching Staff, *i.e.*, the Heads of Departments, the Lecturers and Instructors, will be engaged on a mutual notice of three months, Demonstrators on one month's notice, and Assistants on one week's notice.

2. The Heads of Departments, the Lecturers, and Instructors, will be entitled to full term holidays at Christmas and the Long Vacation, but the vacation at the close of the School Session will not begin until the first Thursday thereafter, and all persons concerned must return to duty on the morning of the Thursday preceding the opening of the New Session. Demonstrators, under the conditions named, will be allowed one month's holiday in the Summer and one week at the close of the Winter Term. At Easter and in Whit Week the School will be closed for Teaching purposes.

3. The Head of a Department will be required to give not less than thirty hours per week, which will include such evening duty as the exigencies of the Department demand, as well as one evening summer course in the third term of the session. He will be expected to give a reasonable number of lectures, supervise the work of his department, and be responsible for the due examination of students' class and home work. Lecturers will be expected to give not less than thirty-three hours per week, Instructors thirty-six hours, Demonstrators and Instructors in workshops forty hours per week, and Assistants other than teachers forty-eight hours per week, including evenings.

4. It will be required of all members of the Teaching Staff that, where the duties of actual teaching begin at 9.15 a.m., they shall be present not later than 9 a.m., and that this interval shall be observed in respect of any other hour of commencement during the day or evening. A rigid punctuality in commencing lectures and other instruction will be expected of all members of the staff.

5. The Head of a Department will be held responsible for the discipline and efficiency of his Department, for the satisfactory attendance of his staff, and for the due care and complete order of all appliances belonging thereto, as set forth in the inventory supplied.

6. In all matters relating to the functions and business of any Department, the Principal and Vice-Principal will deal directly with the Head of the Department, and not with any subordinate member of the staff.

7. A Monthly Report will be required from each Department, showing the subjects taught, the number of students enrolled for each subject, the average attendance, and such other particulars as will enable the progress and condition of the Department to be ascertained.

8. Requisitions for all materials and appliances must be signed by the Head of the Department requiring them, and addressed to the Principal.

9. All repairs or mechanical work required for any Department, or such appliances needed as can be profitably and efficiently constructed in the School, will be done under the control of the Mechanical Superintendent on signed instructions from the Principal.

10. In the event of manufacturers or other members of the public desiring tests or technical investigations to be carried out by members of the staff, and on the assumption that such tests or investigations take place outside the usual teaching times, then the Committee will arrange that the staff shall receive such proportion of the fees as the Committee may determine. Formal arrangements for such tests and technical investigations will be made through the Principal as representing the Committee in such matters.

APPENDIX B.

Approximate Estimate of the Staff required for the various Subjects of Instruction taught in the School, arranged in Departments.

Preparatory.

Head of Department, with Assistants from other Departments.
Lecturer in Modern Languages.

Mathematics.

Professor.
Two Day Lecturers.
Four Evening Lectufers.
Observatory Attendant.

Mechanical Engineering.

Professor.
Four Day Lecturers, one with the rank of Assistant Professor.
One Assistant Lecturer.
One Demonstrator.
One Assistant Demonstrator.
Fifteen Evening Instructors.
One Workshop Instructor (Wood Work).
One Workshop Instructor (Metal Work).
Two Assistant Instructors.
Four Workmen.
One Draughtsman.

Physics and Electrical Engineering.

Professor.
Three Lecturers, one with the rank of Assistant Professor.
Five Evening Lecturers.
Three Demonstrators.
Three Laboratory Attendants.

Architecture and Building Construction.

Director.
One Day Lecturer.
Ten Evening Lecturers.

Pure and Applied Chemistry.

Professor.
Four Day Lecturers, one with the rank of Assistant Professor.
Three Demonstrators.
Directors of the Dye-house.
Two Dye-house Assistants.
Seven Evening Lecturers.
Assistant in Brewhouse.
Dispenser.

Municipal, including Sanitary and other Engineering.

Professor.
Five Assistants.

Printing.

Chief Instructor.
Three Evening Lecturers.
Two Workmen.
One Assistant.

Textile Manufacture.

Professor.
Three Lecturers.
Two Workshop Assistants.
Stockkeeper.
Evening Assistant.
Two Cleaners.
Boy.

Special Subjects.

Six Evening Lecturers.

Natural Science.

Six Evening Lecturers.

Commercial Subjects.

Six Instructors.

Industrial Design and Drawing.

Master of Design.
Two Instructors.
Two Assistants.

Summary.

Preparatory,	1
Modern Languages,	1
Mathematics,	8
Mechanical Engineering,	32
Physics and Electrical Engineering,	15
Architecture and Building Construction,	12
Pure and Applied Chemistry,	20
Municipal, including Sanitary and other Engineering,	6
Printing,	7
Textile Manufacture,	11
Special Subjects,	6
Natural Science,	6
Commercial Subjects,	6
Industrial Design and Drawing,	5
Total,	136

APPENDIX C.

Conditions of Engagement of the Administrative Staff.

1. The engagements of the Administrative Staff, in every instance where the salaries are paid monthly, will be subject to a mutual notice of one month; in all other cases one week.

2. The hours of attendance of the Clerical Staff will be on the basis of a 46-hour week, namely, from 9 a.m. until 1 p.m., 2 p.m. until 5.30 p.m., with attendance on one evening in the week until 9.40 p.m., and occasional attendance, say once in six weeks, on Saturday afternoon. At the opening of the session in September the Clerical Staff will require to be in constant attendance.

3. The hours of the Cleaning Staff will be on the basis of a 52-hour week.

4. The Chief and Assistant Engineers, the Mechanical Superintendent, and the Building Superintendent will be required to give not less than 48 hours per week, and such other time as may be necessary; and the Workmen the usual number of hours which obtain in thir respective trades in the district.

5. The members of the Clerical Staff will be entitled to two weeks vacation in the Summer at the time the School is closed, one week at Whitsuntide, three days at Easter, three days at Christmas, and two at the New Year.

6. The Superintendent of the Building, the Chief Engineer, and the Mechanical Superintendent will be entitled to a similar vacation as the Clerical Staff at convenient times.

7. Where the Clerical Staff are engaged in the conduct of examinations outside their usual hours of service they will be paid at the rate of 7*s.* 6*d.* per examination of three hours.

8. A Weekly Report will be required from the Superintendents of the Building, and the Electric Light and Power Installation, and the Mechanical Equipment.

9. Workmen in the permanent employ of the Committee will be paid the standard rate of wages, and be allowed holidays amounting in the aggregate to three weeks per annum, but their payment per week will be based on a year of 50 weeks.

APPENDIX D.

Approximate Estimate of the Staff required for the due Administration of the New Building and of the Dye House, according to the Scheme set forth in the Report.

1. The Clerical Staff.
2. The Superintendence and effective Maintenance of the Building.
3. The Generation and Maintenance of Electric Light and Power.
4. The Maintenance of the Mechanical Equipment, including Heating and Ventilation.
5. The Restaurant.

OFFICE DEPARTMENT.

Registrar and Cashier.
Assistant Registrar.
Accountant.
Assistant Accountant.
Marks Registrar.
Correspondence Clerk.
Postage Clerk.
Telephone Clerk.
Messengers (2).
Storekeeper.
Do. Assistant.
Doorkeepers (2).

LIBRARY.

Librarian.
Do. Senior Assistant.
Do. Junior Assistant.

MAINTENANCE OF BUILDING.

Superintendent.
Joiner.
Painter.
Plumber.
Porters (2).
Charwomen (10).
Window Cleaners (3).
Lavatory Attendants (2).
Lift Attendants (2).
Dye-house Porter.

RESTAURANT.

Housekeeper and Cook.
Kitchenmaid.
Waitresses.

ELECTRIC LIGHT AND POWER.

Chief Electrician.
Engineers (2).
Electrical Assistants (2).
Greasers (3).
Stokers (3).

GYMNASIUM.

Superintendent.

MECHANICAL EQUIPMENT.

Superintendent.
Joiners (2).
Fitters (2).
Instrument Maker.
Labourers (3).

SUMMARY.

Office Department,	14
Library,	3
Building,	24
Electric Lighting and Power,	11
Mechanical Equipment,	9
Restaurant,	4
Superintendent of the Gymnasium,	1
Total,	66

(3.)

MEMORANDUM showing the EQUIPMENT of the MECHANICAL ENGINEERING DEPARTMENT of the MANCHESTER MUNICIPAL SCHOOL of TECHNOLOGY.

(See the Evidence of Mr. J. H. REYNOLDS, q. 4448.)

Object of the Equipment.

The objects kept in view in deciding on the nature and scope of the equipment were as follows:—

(1.) The teaching of Engineering Science as much as possible by experiment.

(2.) The determination of the technological properties of the materials of Engineering.

(3.) The instruction of young engineers in the usual and best modes of testing—prime-movers, the machinery of transmission, and the machinery for absorption of energy.

(4.) Lastly, and most prominently, the provision of facilities for experimental work by the actual leaders of industry, or their appointed deputies, on the present-day problems of engineering design.

The equipment is, in view of the fourth requirement just stated, on a much greater scale than has ever been attempted before (except in a few of the Transatlantic schools); and each piece of plant installed has been specially designed to investigate one or more practical problems of Engineering utility specially important to the British manufacturing engineer.

The description of the various laboratories in detail will elucidate the aim of the whole better than any mere generalised statements.

The Steam Engine Laboratory.

The broad principles which govern the direction in which improvement of the steam engine must proceed are fairly well understood by manufacturers; but one of the sources of loss which has hitherto been unsuspected or, at all events, minimised, that of the possible leakage of steam in large quantities past the admission and exhaust valves of steam engines, has been selected as the prime object of study in connection with the large experimental engine which has been installed in this laboratory. This engine was accordingly specially

fitted with appliances for varying the modes of steam admission and exhaust, and with means for measuring and recording the amounts of leakage which may take place under those varying conditions.

The engine was built to the special designs of Dr. J. T. Nicolson, by Messrs. James Carmichael and Co., of Dundee. It is of the horizontal compound side-by-side type, having cylinders 11½ inch and 20 inch diameter, with 3 feet stroke. The engine is provided with two cylinders of each size, either of which may be used as desired. One of the 20 inch cylinders has slide valves with Meyer expansion plates, and the other has Corlis valves and gear. Of the two 11½ inch cylinders, one is made by Gebrüder Sulzer, and fitted with their design of drop valves, and the other has Corliss valves and gear of the same type as for the 20 inch Corlis cylinder. Thus a comparative study may be made of the effect of type of valves, *e.g.*, Sulzer *versus* Corlis, or Corlis *versus* slide-valves; and of the effect of size-variation by experiments on the 11½ inch and 20 inch Corlis cylinders.

The pressure may be anything up to 250 lbs. per square inch, and the speed up to 110 revolutions per minute. Each end of each cylinder has separate exhaust pipes, so that the amount of steam taken by these respectively can be found by measurement after condensation in separate surface condensers.

The ends, sides, and pistons of the cylinders are steam jacketed. The steam, when supplied to any of the cylinders, may alternately go directly into the steam-chests, or may be passed through the jackets before entering them. In the latter case it may or may not pass through a water separator. Steam may alternatively be supplied to the jackets directly from the main steam pipe. The total horse power indicated may reach 350.

The special feature of the engine, as already indicated, is its adaptation for testing the rate of leakage of steam past the admission and exhaust valves. For this purpose, in the Corlis cylinder, each valve casing is a separate casting bolted to the cylinder, with an intermediate thin plate, which may either have an opening through it corresponding to the port area, or may be blank, so as to shut off the cylinder from the steam chest. Thus, when the valves are operated (from the other engine by the crank shaft) under steam pressure, the amount of steam which leaks past the valve when it is closed can be measured by attaching vessels for catching the leaking steam, to the valve casing, and connecting them to the space between the valve and the blank plate, with the interposition in the connection of a long plug valve operated by levers from the Corlis valve spindle itself.

By preliminarily admitting steam to the vessels and then throttling or opening their exhaust pipes, the conditions of pressure on the two sides of the main valve may be made to approximate to those occurring during actual running, and indicator cards may be taken from the vessels to show the rate of variation of pressure in them due to leakage while the valves are in motion. Allowance can also be made for the condensation taking place in the vessels, by taking the temperature of their walls and finding the condensation area from this and the cards.

In the case of the slide-valve cylinder, a thin plate is also interposed between the back of the valve-chest face and the cylinder port facings, so that the same experiment can be made with this as with the admission valves of the Corlis cylinders. Recesses have been provided in the back of the valve-chest face, in which coils of small piping are placed, so that, when desired, the valve faces may be heated by circulating live steam, or cooled by circulating cold water therein. By this means, and by the insertion of thermometers within its substance, the valve face may be brought to the same state as to temperature as when working normally.

In the case of the Sulzer cylinder the leak may be studied by cutting off a portion of the cylinder close to each end, from which cards may be taken when the valves are being operated under pressure.

In all the four cylinders duplicate exhaust valves of the drop pattern are fitted at each end. These auxiliary valves are driven by special gear from the valve motion, and are arranged to open and close simultaneously with the main exhaust valves, whether of the Corlis, Slide-valve, or Sulzer pattern. By then taking indicator cards from the spaces between the main and auxiliary valves, the leakage can be determined, and the rate of leak during actual working inferred.

The Boiler Plant

supplies steam primarily for the electricity generating station of the school; and secondarily for the experimental engine. The plant itself will form the subject of much experimental study; for the determination of the evaporative efficiency of the various arrangements of furnace and heating surface provided, and the estimation of chimney radiation and other losses.

The boilers are three in number:—

(1.) A water-tube boiler, by Babcock-Wilcox, of 150 horse power under natural, and 200 h.p. under forced draft.

(2.) A boiler of marine type, by David Rollo and Sons, Liverpool, capable of developing 300 horse power under natural, and 450 under forced draft.

(3.) A water-tube boiler, by Messrs. Palmer, of Jarrow, on J. W. Reed's patented system, of the same powers as No. 2.

(4.) A Schmidt superheater of 400 square feet heating surface provides the means of trying experiments with superheated steam. It is separately fired.

Ventilating Plant:—Sturtevant Plenum System.

The large amount of steam necessary in cold weather for the heating of the air blown into the building by the ventilating fans, rendered it possible to generate electricity as cheaply in a special station in the school as it could be bought from the Corporation; and no doubt was felt as to the judiciousness of erecting such a station, when the further highly desirable subsidiary uses of such a station in the school were kept in view; those, viz., of making progressive trials of the various types of engine and dynamo plants, as time went on; and of affording practical instruction in central station working to senior students.

The steam is exhausted from the station engines into the steam coils placed in the exhaust of the ventilating fans, and after partially condensing therein, is completely condensed in a surface condenser, and returned by means of an air and feed pump to the feed-heater and the boilers. It is intended to maintain a vacuum in these coils by means of the air-pump and surface condenser; and to heat the air from the ventilating fans up to the required point in cold weather by means of live steam in the last few coils of the heaters.

The whole plant is specially fitted with spare drain and discharge pipes, and feed-pumps for measuring purposes, so that the economy of this system of ventilating may be settled.

In this way each part of the plant is intended not only for service, but also for research along strictly practical lines.

Electricity Station.

This station is of a capacity of 450 kilowatts. It is intended to supply the lighting current for the main and the Dyeing buildings, about 300 horse power; the current for power for the same, about 340 horse power (maximum); and the current for experimental work in the electrical and electro-chemical laboratories.

There are four units of 100 k.w. each, and one of 50 k.w. They are chosen to represent different types of engine and dynamo; as the intention is to make economy tests of every plant once every year. The four 100 k.w. sets are as follows:—

One slow-speed side-by-side compound steam engine, by Marshall and Sons, Gainsborough, driving a four-pole shunt-wound dynamo, of Scott and Mountain's make, by means of ropes.

One Browett-Lindley, Mather and Platt direct connected set; compound engines and shunt-wound dynamo.

One Williams-Bruce-Peebles' set, as above.

One tandem compound overhung crank, Robb Engineering Company's steam engine, of the American automatic cut-off high speed type; direct connected to a 4-pole dynamo, by Dick, Kerr & Co., Preston.

One 50 k.w. Parsons' turbo-electric generator. A fine switchboard of six panels, by Cowans, Limited, and a Valancer and Vooster set, by the Lancashire Dynamo and Motor Company, complete the equipment.

Hydraulic Laboratory.

This laboratory is on a specially large scale. Its object is the practical testing of turbines, pelton wheels, reciprocating and centrifugal pumps, and the determination of the losses of head occurring in the flow of water through cocks, valves, and pipes, whether bent or straight.

A tank, capable of holding 13,000 gallons of water, is built into a special house, at a height of 120 feet above the laboratories. From this tank the water flows through 12-inch cast-iron mains to the turbines, is discharged from them over a measuring weir four feet wide; thence travels through a long trench to a

forebay, delivering into six large measuring tanks; and is finally pumped back to the high tank by a twin series centrifugal pump. The quantity of water may amount to 3,000 gallons per minute, and its amount can be determined by weir measurement or by volumetric measurement in the tanks. A special feature in this arrangement is the provision of a cast-iron vee channel, 110 feet long, by means of which the flow of water at small differences of head can be studied. The gradient can be varied from 0 to 1 in 20.

A reciprocating pump of a capacity of 300 gallons per minute is provided, supplying water at any pressure up to 300 lbs. per square inch, for the purpose of studying flow of water at these high pressures in cocks and valves.

The pump itself is fitted with valves of all the more common types, and it is intended to take diagrams of the actual motions of these valves under varying conditions, so as to deduce the terms of their action.

This is a problem of great practical importance, as next to nothing is known about the action of pump valves as depending on speed, load, and resistance.

The turbines of 25 h.p. each are also specially fitted for observations of the losses to which they are subject by surface friction and eddies in the wheels and guide blades.

Electric motors, two in number, one of 250, the other of 120 brake horse power, supply power for the pumps. The former drives the twin series Gwynne pumps, and alternatively an experimental two-stage air compressor; the latter drives the reciprocating pump, or alternatively the shafting for the machine-testing laboratory.

Machine-testing Laboratory.

This laboratory is intended for the testing of the efficiency of machine tools, &c. It is provided with transmission and absorption dynamometers up to 40 horse power; and with Horn's tachographs, for making observations of speed variation in revolving machinery. A special belt, rope, and chain efficiency testing-machine is under construction, and means for measuring the stretch and slip have been arranged for.

A new design of lubricant testing-machine has been got out for this laboratory. In addition to the ordinary viscosimeters and temperature tests, durability tests will be made, when not only the coefficient of friction, but the heat generated by the journal in the bearing will be measured.

The design of the machine is one tending to greatly increase the sensitiveness of the test record.

Gas and Oil Engine Laboratory.

This laboratory will be one of the most complete in the school. The large tanks used for water measurement can be closed and filled with air to 150 lbs. pressure. The supply for the gas and oil engines can be taken from these at given initial and final temperatures, pressures, and volumes; and being supplied to the engines through the intermediary of an air holder at atmospheric pressure, the quantity used can be measured accurately. The plant installed is as follows:—

One Crossley 20 b.h.p. gas engine, with blowing cylinder and Crompton dynamo for dynamometer.
One National 20 b.h.p. gas engine.
One Hornsby-Akroyd oil engine, 20 b.h.p.
One Fielding and Platt oil engine, 20 b.h.p.
One Dierl motor, new type, of 15 b.h.p.

All these engines (except Crossley's) are specially fitted for experiment, with thermometer holes in the cylinder walls, and platinum thermometers in the working substance.

One Linde's and one Hall's refrigerating plant, each of a capacity of one ton of ice per 24 hours, are installed. Means for varying the coil surface and speeds of brine circulation are provided, so as to study the efficiency under very varying conditions of working.

Materials-testing Laboratory.

This laboratory contains a 44 ton hydraulic accumulator and automatic pressure-intensifying pump, and a 50 ton horizontal testing machine, by Joshua Buckton and Co., Leeds. A cotton press, by John Shaw, Salford, has been adapted to become a 250 ton compression testing machine, with autographic recording and automatic pressure-regulating devices, by the Cambridge Scientific Instrument Company and Messrs. Isaac Storey and Son, Manchester.

Three machines of 25 tons capacity, by Amsler Laffon, of Schaffhausen, are fitted, one for tension, one for compression, and one for beam-bending experiments. A special torsion machine for large shafts, pulleys, and spin wheels is also under construction for this laboratory. Cement testing, both in tension and compression, will be carried out in this laboratory, and one W. H. Bailey's testing machine is provided for the purpose.

JOHN T. NICHOLSON.

November 26th, 1901.

(4.)

NOTES on the PHYSICS and ELECTRICAL ENGINEERING EQUIPMENT of the MANCHESTER MUNICIPAL SCHOOL of TECHNOLOGY.

(See the Evidence of Mr. J. H. REYNOLDS, q. 4448).

The accommodation consists of twenty rooms, situated on the basement, ground, first and second floors of Whitworth-street wing.

In the sub-basement is a Photometer Room, about 60 feet long, fitted with the double standard photometer of Simmance and Abody, by Alexander Wright and Co., and with certificated French and German, as well as English standards of light. It will also be fitted with special photometers for arc and incandescent electric lamps. This room will also be fitted with a grating spectrum apparatus by C. A. Steinthal Söhne, of Munich, and with other optical apparatus for technical work.

The Electrical Engineering Laboratory will contain special arrangements for the examination and testing of the smaller dynamos, motors, and transformers for continuous, alternating, and polyphase currents. The dynamo room contains the larger plant of a like character, and a special feature is the experimental electric tram car truck, which is mounted with motors and controllers complete over a system of brake wheels and dynamometers, which will enable a complete series of tests to be carried out under actual working conditions. It is hoped by this means to obtain a direct comparison between driving by continuous currents and by three-phase motors in cascade for traction purposes.

The Electro-technical Laboratory is equipped for dealing with the more refined measurements required in electrical work.

The Advanced Physical Laboratory is equipped with apparatus for advanced work in Heat and Magnetism and Electricity.

The Standardising Room is equipped for the testing and culibration of current measuring instruments up to 4,000 amperes, and for pressures up to 100,000 volts. This range being greater than any other laboratory in this country, all high pressure work will be carried on in the High Tension Room adjoining, which has been specially designed for the purpose. Lord Kelvin's current balances and the Crompton potentiometer are used for current measurements, and Mr. G. L. Addenbrooke's electrostatic instruments have been adopted for alternating current work. English resistance standards are being made by the Cambridge Scientific Instrument Co., German standards by Otto Wolff, of Berlin, and the French by Carpentier. It is anticipated that this section of the Department will be of considerable use to the large electrical manufacturers who are so fast settling round Manchester.

The department also contains special laboratories and rooms for Research work, Telegraphy and Telephony, Electric Wiring and Fitting, and other work of a technical nature. It also contains a laboratory for Electro-Chemical Engineering, where the engineering processes in connection with Electro-Chemistry can be carried out. For this purpose a motor generator, set by Schniekit, in the Dynamo Room, will give current up to 600 amperes at 70 volts, and alternating currents up 40 kilowatts, at any pressure desired. Large direct currents at low voltages are also available.

ALFRED SCHWART.

To the Principal.

(5.)

REPORT by Mr. J. H. REYNOLDS on his visit to the PARIS CENTENNIAL EXHIBITION.

(See the Evidence of Mr. J. H. REYNOLDS, q. 4464.)

TO THE TECHNICAL INSTRUCTION COMMITTEE OF THE CITY COUNCIL OF MANCHESTER.

GENTLEMEN,

I have the pleasure to present a brief report upon the Paris Centennial Exhibition (which has just closed its doors), so far as it concerns Educational work, and in respect of its value to those engaged in the administration of schools for Science, Art, and Technical Instruction.

I spent the whole of Whit-week within the Exhibition itself, and the greater part of that time was devoted to the Educational section. By your direction I spent the first ten days of the present month in a second visit to the Exhibition, the main purpose of which visit is fully explained in the latter paragraphs of this report.

On this second occasion I was fortunate in having the privilege of the Chairman's presence and companionship, which amongst other advantages secured the achievement of the chief purpose of the visit.

Viewing the Exhibition externally, and as a whole, it was a marvellous display of executive skill and arrangement.

Whether regarded from a constructive and engineering standpoint, or from the point of view of form and colour, the various features of the Exhibition which struck the eye moving through it and about it were endless in their variety and offered most suggestive examples and inspiration to the engineer, the designer, and the artist.

The extraordinary variety of type shown in the beautiful pavilions of the nations which lined the Quai d'Orsay, were in themselves, being in many cases reproductions on a large scale of famous buildings, a most striking object lesson as viewed from the river in the bright sunshine.

In the new Alexander III. bridge, leading to the Esplanade des Invalides, flanked on the approach to it on the left by the Palace of the Retrospective Arts (a minor South Kensington), and on the right by the larger building, the Palace of the Fine Arts,—both magnificent specimens of French Architecture to remain as permanent memorials of the Exhibition,—there is a beautiful example of the French gift for combining elegance of line and curve with the appearance of great lightness and real strength of construction. This bridge, which is said to be the broadest in the world, has at each end, and on each side, splendid monumental structures of stone, elaborately sculptured with figures of heroic size, which structures, from their great weight, probably serve as a necessary equipoise in preserving the stability of the bridge.

The audacity of conception, which not unfrequently characterised the efforts of French architects and engineers, was well illustrated in the instance of the Porte Monumentale, one of the chief entrances to the Exhibition, which, though it was accompanied by a somewhat bizarre style of decoration and treatment, unattuned to sober English taste, struck the imagination and compelled admiration however much it may be tempered with criticism. The base reliefs on each side of the gateway were beautiful examples of modelled design, full of spirit and movement, and representing in a most realistic, yet artistic spirit, the development and incidents of modern industry and commerce.

It was gratifying to note that amongst the pavilions before named, some of which were loudly assertive of the claims of their nationalities to prominence, the modest English Manor House, which stood for great Britain, more than held its own. The quiet homeliness of its exterior gave no hint to the casual visitor of the rich and rare treasures of art which it enshrined, nor of the deep pleasure which a momentary inspection of them, and of the beautiful rooms in which they were contained, had in store for him. It is certain that English taste as represented in this pavilion has made good its claim to the respect and admiration of foreign critics.

Writing of the Exhibition as a whole, it is impossible not to marvel at the amount of artistic skill at the disposal of the French architect. Never before has cement contributed so largely to the erection of monuments of architectural beauty, in which the human figure has played so conspicuous, if not always, an unrestrained part.

The opportunity of instruction in the arts and practice of design has evidently not been lost on the French artizan. How else could these vast structures, with all their wealth of ornament in modelled figure and in painted fresco, have been produced? Certain it is that in this respect at least no other nation could have commanded the same amount of skilful craftsmanship, or have realised the like magnificent result.

To the Educational Department extensive space was assigned in the great building which enclosed three sides of the Champ de Mars, and naturally the exhibits of the schools of France occupied the greater part of the space.

They deserved this, not merely because they are, so to speak, on the spot, but because of the extent, range, variety, and great excellence of their exhibits.

These exhibits embraced the whole field of the highly organised system of French education, including Infant, Primary, and Secondary instruction and training—normal schools, and institutions—Colleges and Universities—Schools for the Fine Arts, and for Design and Decoration—Technical Schools—Agricultural Schools—together with the work of associations of all kinds for the promotion of instruction and training in all branches of the Arts and Sciences, and in the application of these to the various industries. The work of the Trade Guilds of Masters and Workmen was also fully represented.

The work of the French Schools in the Infant, Primary, and Higher Primary stages, and in the normal training institutions, was shown by Departments of the Republic, each of the great divisions, in which the Republic is divided, making its own special exhibit. In this group there were more than 4,000 special exhibits. They were most excellently arranged and displayed, and gave a very satisfactory reflex of the system, and the means and methods of instruction as they exist in France in these grades.

As might have been expected, the display illustrating the means of instruction and the results achieved in Design and Decoration in France, was extremely important and valuable. It extended to no less than 252 independent exhibits, and was full of the most varied interest and suggestions. It could not fail to have given to teachers of design much valuable information and useful inspiration. All the great schools devoted to the Decorative Arts made a most important display of their methods and results, and every Department of the Applied Arts found adequate representation. Many of the smaller arts and crafts were admirably shown, and it was evident that most praiseworthy efforts were made by voluntary associations of employers to secure satisfactory training for the apprentices and workpeople engaged therein. This was well exemplified in the instance of the Free School of Bijouterie in the Rue Chapuy, Paris, which presented a most interesting exhibit, illustrating in every stage the production of enamelled metal work for personal decoration, and one could see at a glance how skilfully the entire course of instruction was organised.

In short, the Free Schools for the instruction of apprentices in the artistic crafts, for the products of which Paris is so famous, seem to abound. They extend moreover, to Evening Schools of Masonry, Carpentry, Joinery, Smiths' Work, Embroidery, Leather Work, House Painting and Decorating, and Plumbing; and fine examples and models were shown of the work done by their students. The most notable feature, however, was not these models, excellent as they were, but the drawings from which they were made, in which the students showed that they had fully mastered the principles of geometry and design, and brought these into use in the execution of their work.

Whether the art of the French decorator pleases our more sober taste or not, it is quite clear from its lavish display throughout the Exhibition that we could not produce it to the same extent even if we would.

In an annexe in the Avenue de Suffren adjoining the main building in the Champ de Mars is a further display of the work, amongst others, of the six Ecôles Nationales Professionelles of France. It is truly a most remarkable exhibit. These schools, according to locality, devote themselves to Engineering—the building trades, or the textile industries—sometimes to all three. They appear to be attended by pupils up to eighteen years of age, who give about fifty hours per week to study and practice. The work shown by them was in the highest degree, creditable, and such as in my opinion could not be produced in any English school, nor perhaps be thought desirable to produce. They were represented by fine examples of large tools, steam and gas engines—with

their patterns and drawings—and by splendid specimens of carpentry, which took the form in the School of St. Etienne of the finely designed canopy (constructed by the students), fifteen feet square and thirty feet high, containing the school exhibit. These schools are intended to prepare youths for the position of foremen, and if the capacity of the pupils is equal to their knowledge and training, they must furnish excellent recruits to French industries.

In this annexe, in a room assigned exclusively to its display, was to be seen the splendid work of the Ecôle Centrale of Paris. This work was illustrated entirely by drawings and memoirs. I was fortunate enough to have the opportunity of visiting this famous school on Tuesday, the 6th of November, accompanied by the courteous and well-informed Director of the English Educational exhibit, Mr. Fabian Ware, by whose aid I was enabled to get a most satisfactory insight into the methods and aims of the School. It is attended by 750 men, who, at entrance, are not less than eighteen years of age, and who, with a view to a diploma, enter upon a course of scientific and technical instruction extending over three years. Each year 250 students are admitted on a most severe competitive entrance examination, mainly Mathematical. They are recruited, not as might be expected from the Ecôles Nationales Professionelles which could not, the Director stated, supply satisfactory candidates, but from the highest departments of the best Secondary Schools of the State, after a training of a purely general character. So regular is the attendance that of 250 students entering in the first year, 245 would be found at the close of the third.

The remarkable feature about the School is that all the students take the same course (the wisdom and expediency of which the Director stoutly defended), no matter whether the future career of the students was to be that of a chemist, engineer, metallurgist, or architect.

The last month of the third year is devoted to the production of diploma work, which work is kept by the School and bound in large volumes. This work comprises the execution of a project, accompanied by a suitable explanatory memoir, which project the student chooses out of some 200 offered to him. In the case of some of these I found that they comprised thirteen or fourteen large sheets of drawings, beautifully inked in, coloured, and dimensioned, ranging from the general plan to drawings of every variety of detail of construction. All are expected to be original in design, and are the students' own unaided work. As an example of their character, I observed one set, illustrative of a complete design for the treatment of Coal Tar derivatives—another that of a design for a Bessemer convertor house and appliances for the production of a given number of tons of steel per day. With such a training the students on leaving the institution at twenty-one or twenty-two are expected to be able to turn their acquirements to any department of industrial life, and in proof of their ability to do this, a list of hundreds of names was shown me of students in all branches of industry. The men, the Director said, would turn their hands to anything, no matter how humble, in order to gain the actual experience the School could not give, trusting to their education to enable them to rise quickly to positions of responsibility and profit. Observation of the work of these French Schools leads me to the conviction that the students are men of rare industry and perseverance. No discipline, said the Director, was needful in this School. The men had made too many sacrifices, and were too eager in their desire to gain the diploma, to make any measures of discipline necessary.

A remarkable feature of the organisation of education in Paris is the enormous number of free schools and free courses of instruction in every department of knowledge. I do not think the extent and the value of this is quite realised by us. The City of Paris, the authorities of the Sorbonne, the Chamber of Commerce, the Philomathic and Polytechnic Societies, the Associations of Employers, and the Catholic Clergy, all unite in offering instruction covering the whole field of human knowledge, and the liberal, industrial, and domestic arts. No sacrifice appears to be too great to bring the means of education within reach of all the citizens and the walls of the Hotel de Ville were covered with announcements of the various courses.

In the Exhibition itself many other European nations, and even far Japan, made a splendid show. Notably is this the case with Russia, Scandinavia, Belgium, and Switzerland, and in this connection I cannot leave unnoticed the entirely remarkable display of the School of Industrial Art of Geneva—enshrined in a pavilion by itself.

Pottery, metal work, wood and stone carving, embroidery, stained glass, enamelling—all these beautiful crafts found exquisite representation, and stamp this School as among the very first of its class for the training of decorative designers and workers.

It is a remarkable fact that Germany, so sedulous to make a striking impression by the abundance and excellence of its industrial exhibits, showed nothing of the work of its schools. The fruits, but not the springs, of action were shown, and the Exhibition is the poorer therefor.

Of the English Exhibit I can only say that it appeared to me to reflect rather the chaos than the real achievements and best results of English educational effort. Despite the earnest labour given to it by those immediately responsible, there has neither been money enough at disposal, nor the systematised, authoritative direction which could result in a satisfactory presentation of English education. One exception may however be made, namely, the exhibit organised by South Kensington of Gold Medal and other premiated works in the National Art competition. These have challenged the admiration of foreign critics, and caused the French authorities to say that they wondered, since such excellent designs can be produced, how it was that English manufacturers came so largely to France for designs.

As evidence of the appreciation with which foreigners regard the efforts of English designers, it is desirable to remark that the greater part of the fine collection of splendidly bound books shown by the Oxford University Press has been purchased for foreign museums and art schools, and that it was stated to me that many thousands of pounds had been spent in the Exposition in this way in order to secure fine examples of decorative art for these schools and institutions.

Before passing from this brief account of continental school exhibits, it is desirable to call attention, because of its high educational value, to the remarkable collective exhibit of German mechanicians and opticians included in the educational section. Ninety-eight firms contributed to it, with the evident purpose of impressing upon foreign visitors, in a way that separate exhibits would have failed to do, the high position Germany has achieved in the manufacture of instruments of precision for which, with every advance in education and scientific research, there is an increasing demand.

The collection was placed in charge of a scientific expert, with qualified scientific assistants, whose business it was to explain to inquirers and intending purchasers the purpose and merits of the various exhibits.

The illustrated catalogue of 253 quarto pages, is a model of skilful compilation, and is published in three languages. Its preface bears eloquent and convincing testimony to the debt which the industry owes to the schools.

It pays a tribute of praise to the excellence of the products of English and French mechanicians, and states the fact that up to twenty years ago Germany was quite unable to contest their claim to pre-eminence. Now all is changed.

In some departments of scientific instrument making, such as optical glass, spirit levels, small sized astronomical instruments, photometers, meteorological instruments, electrical appliances, Germany is claimed to stand without a rival.

The export of scientific apparatus and of optical glass has trebled in ten years, and now reaches in value per annum upwards of £713,000, and their manufacture employs 13,625 persons in 790 establishments.

But the remarkable feature is that the manufacturers in this preface freely acknowledge that they owe this great advance and pre-eminence to the schools, to the encouragement of the various governments in the promotion of scientific research, and to the introduction of the metric system which gave a great impetus in the construction of exact weights and delicate balances.

A union was formed in 1881 of scientific men and of mechanicians and opticians throughout the German Empire, with the express purpose of promoting the scientific, technical, and commercial development of philosophical instrument making, and an official Journal, "The Leitschrift für Instrumentenkunde" was then established.

German instrument makers eagerly sought the assistance of scientists, and the majority of the leading firms now retain one or more experienced mathematicians and physicists in their service.

In the preface before-named the main credit for the great advance in Germany's production of scientific instruments and glass is freely given to the Imperial Physical and Technical Institute of Berlin, the scientific department of which devotes itself to purely physical research, the results of which it places at the disposal of mechanicians, whilst the technical department applies itself to matters concerning the construction of philosophical instruments.

It is repeatedly stated in the preface to the catalogue that this or that department of scientific instrument making has owed its success entirely to the researches of the schools. For example, so runs the preface, "About twenty years ago the manufacture of thermometers had come to a dead stop in Germany, thermometers being then invested with a defect, their liability to periodical changes, which seriously endangered German manufacture. Comprehensive investigations, carried on by the Imperial Physical and Technical Institute and the Jena Glass Works, brought about the desired reward..." in consequence of these systematic efforts the manufacture of thermometers has reached in Germany an unprecedented level, and now governs the markets of the world." "The manufacture of electrical measuring instruments has greatly profited by the fundamental labours of the Imperial Physical and Technical Institute." To the "master mind" of Professor Abbe is due the "profound influence" of theoretical investigation "upon the development of German optical science and manufacture." These extracts serve to indicate how deeply the German manufacturer esteems the results of scientific research, and how ready he is to apply them in the development of manufactures.

Amongst other features of high educational value in the Exposition, mention must be made of that of the Ville de Paris, in which, by means of diagrams, pictures, and models of a most realistic character, the municipal activities of the City were fully displayed.

Apart from its advantage in giving to the citizens a complete view of the various municipal enterprises which contribute to, and secure their comfort and well-being, and thereby reconciling them by an effective object lesson to the heavy expense, it, of necessity, entails, this exhibit becomes, from a technical point of view, of the greatest possible value to the students of civil and sanitary engineering, of curative and preventive measures necessary for the maintenance of the public health, and of gas, hydraulic, and electrical engineering.

If such a representation of the vast and varied municipal enterprise of the City of Manchester were available, it would, whilst being of the greatest interest to the citizens at large, be a most effective instrument in the training and instruction of technical students.

But of all the Educational exhibits of foreign nations, none is more remarkable than that from the United States of America. It is most admirable, from whatever point of view it is regarded, and is the result of a well directed policy, backed by ample funds.

With a view to a satisfactory representation of American education, an organiser, namely, Mr. Howard J. Rogers, of Albany, New York State, was appointed by the Government in February, 1899, and it is easy to see what a great gain has resulted from setting a competent mind to work to bring together a display which should adequately express the systems of Primary, Secondary, Scientific, Technical, Artistic, and University instruction in the vast territory of the Union.

Splendid use has been made of Photography, and by its means it has been possible to bring within a comparatively small compass a fairly adequate bird's eye view of the vast organisation in all its chief ramifications. The United States Government has spent more than £5,000 in its preparation, and nothing could be more satisfactory than the result.

The plan briefly has been to select five or six of the great cities east and west of the Union, and to request the superintendents of education to prepare a set of illustrations which would convey a complete view of the Primary, Secondary and normal educational facilities and conditions of each city. These are shown in cases of hinged frames, containing some forty large photographs or other illustrations in each case. The trade school exhibits are shown separately, and so are those of the great Technological Institutions. In the instance of the Universities, such as Yale, Harvard, Cornell, Columbia, each has undertaken to make a special exhibit of some chief feature of its work. The net result is that the American exhibit gives a complete view of education as seen in the States to-day, and it cannot fail to be of great educational value and inspiration, not only for teachers, but for administrators engaged in the work of education.

One of its most important and quite admirable features is the fine monographs—nineteen in number—some of them extending to upwards of sixty pages, produced under the editorship of Professor Nicholas Murray Butler, of Colombia University, New York, dealing with all phases of educational activity. They are excellent in tone, frank in criticism of their own methods, and full of the most useful suggestions.

After my first visit I reported to you that the Committee could not render a better service to education in this city and district than to take steps to secure this exhibit as a whole for Manchester, and you authorised the Chairman to take at least preliminary steps to secure it if possible.

The Chairman, on his visit to the Exhibition, fully confirmed my recommendation, and gave authority to proceed with the negotiations with the United States Commissioners.

These have been brought to a satisfactory conclusion, and an agreement has been made, subject to your approval, whereby certain of the fittings have been purchased, and the whole of the collection loaned for Exhibition in Manchester. An agreement has also been made with the Co-operative Wholesale Society, Ltd., to ship the exhibits, by their steamer, to Manchester via the Canal.

It only remains to say that the American authorities have shown the most hearty good will in the matter, and the most commendable desire to promote the object the Committee had at heart in desiring this unique exhibit for display in this city.

J. H. REYNOLDS, Director.

November 15th, 1900.

(6.)

EXTRACT from the PROCEEDINGS of the TECHNICAL INSTRUCTION COMMITTEE of MANCHESTER of the 2ND JANUARY, 1896, prepared for the information of the MEMBERS of the COUNCIL.

REPORT as to the RELATIONS which should subsist between the SCHOOL BOARD and the TECHNICAL INSTRUCTION COMMITTEE in MANCHESTER.

(See the Evidence of Mr. J. H. REYNOLDS, q. 4509.)

Resolved,—

That the following report now submitted be approved.

[COPY]

REPORT.

Report of the Sub-Committee appointed at a Joint Meeting of the Representatives of the School Board and the Technical Instruction Committee, held Thursday, December 12th, 1895, at the Offices of the Manchester School Board, to consider the relations which should subsist between the Manchester School Board and the Technical Instruction Committee in respect of the New Central School and the New Municipal Technical School, and to prepare a scheme dealing therewith.

Preamble.

The Sub-Committee have carefully considered the subjects of instruction, together with the aims and conditions of working of the two Institutions.

They now recommend the adoption of the following scheme, which has for its object the effective co-ordination, due grading, and economical management of the work undertaken by both Institutions.

The scheme is intended to realise the following aims:—

(*a*) The prevention of overlapping between the two Authorities with respect to the objects and subjects of instruction undertaken in the Day and Evening Departments of the respective Institutions.

(*b*) The promotion of the supply of Students for the Technical School and other places of higher education—(1) of those who desire the more specialised forms of instruction of the Day and Evening Departments of the Municipal Technical School, and (2) of those who desire to continue their general or professional education at the Grammar School or the Owens College.

The scheme is presented in broad detail as follows:—

School Board to continue the Organised Science Day School, including the Preparatory Department of the Technical School.

1. The School Board shall conduct in the new Central School, shortly to be erected, the work of the Organised Science School now carried on in the Central School, Deansgate; and the Preparatory or Manual Department of the Municipal Technical School shall be discontinued.

Curriculum of the Organised Science School.

2. The curriculum of the Organised Science Day School shall be so arranged as to fit in with the subsequent courses of the Day Technical Departments of the Municipal Technical School. In the case of pupils desirous of proceeding to the Manchester Grammar School, the Girls' High School, or other Secondary School, the object of the instruction shall be to fit such pupils for the courses of instruction at such First Grade Secondary Schools.

Preference to be given to Local Scholarships.

3. The pupils of the Central School shall be encouraged to compete for the Scholarships which may be legally tenable at the Schools of the Technical Instruction Committee, at the Grammar School, or at the Owens College, and generally to avail themselves of the facilities offered for Higher Education in Manchester rather than for the National Scholarships or Royal Exhibitions now held at the Royal Colleges of Science of London or Dublin.

Bursaries.

4. Bursaries shall be founded by the Technical Instruction Committee tenable for three years: during the first two years at the Organised Science Department of the Central School, and during the last year at the Municipal Technical School. These Bursaries shall be of the following value:—

1st year, ...	... £9	Tenable at the Central School.
2nd year, ...	... £12	
3rd year, ...	... £15	Tenable at the Municipal Technical School.

The arrangements of the examinations for the award of these Bursaries shall be made by the Technical Instruction Committee, and the Competition for the Bursaries shall be open to all Manchester pupils in Public Elementary Schools, or in any other Schools of the City.

By this means pupils who intend to devote themselves to industrial or commercial pursuits may have continuous instruction, and thus be enabled to proceed to the Municipal Technical School, or to other places of higher instruction, with a view to their further advancement.

Limit of Science and Art Instruction in Board Schools.

5. The School Board at the Central School shall cease to give Science and Art instruction to Day students beyond the stages required by the regulations of the Education Department, Whitehall, or the scheme arranged for Organised Science Schools. The School Board shall also cease to give instruction in Science or in Art in the Central Evening School, and the School of Art at the Central School shall be discontinued.

Technical Instruction Committee take over Science and Art Instruction.

6. The Technical Instruction Committee shall provide in the evening for all the subjects of the Syllabus of the Science and Art Department, and for the Art instruction hitherto conducted in the Central School.

Honours Instruction in Science and Art.

7. All Honours Instruction in Science, and Advanced Instruction in Art, hitherto given at the Central School, including the special courses for the Art Class Teachers' and the Art Masters' Certificates, shall be given respectively in the Municipal Technical School and the Municipal School of Art.

Teachers' Classes.

8. Provision shall be made by the Technical Instruction Committee in separate classes for the instruction of teachers in such subjects as Wood and Iron Work in the Municipal Technical School in co-operation with the School Board; and in Drawing exclusively for Pupil Teachers, either at the Pupil Teachers' centres, or at the Municipal School of Art.

School Board to take over Evening Commercial Instruction.

9. The Technical Instruction Committee shall transfer to the Central School all the Commercial instruction now given in the Municipal Technical School, and shall cease to teach the subjects comprised in the course of the Commercial Evening School, *e.g.*: English Composition and Correspondence, Arithmetic, Writing, Book-keeping, Shorthand, Type-writing, and Foreign Languages.

This arrangement is not to exclude the Municipal Technical School from providing courses of study or lectures in Advanced Commercial Knowledge, such courses to be included in the subjects set forth in the curriculum of the Central Evening Commercial School, the qualified students in which may attend these courses, and the attendances be registered with those made at the Evening Commercial School.

Pupils under eighteen years of age may be enrolled as students of the Central Evening Commercial School, provided that they possess the necessary educational qualifications.

Facilities for Graduate Courses.

10. The Central Evening Commercial School shall continue to provide the facilities hitherto available for preparation in the subjects of University Graduate Courses, the Science instruction needed being given in the Municipal Technical School.

Free admissions to the Technical School and School of Art.

11. A system of Free Admissions, with or without small Bursaries to the Evening Classes of the Municipal Technical School and the Municipal School of Art shall be arranged, and the privilege of Free Admission competed for annually by pupils of the Public Elementary Schools who have passed the Sixth Standard. The Examinations shall be conducted by the School Board in such subjects, and with such regulations as to age and degree of proficiency, as may be approved by the Technical Instruction Committee, having regard to the present or intended occupations of the competitors.

Interchange of Teachers.

12. The Technical Instruction Committee will, as far as desirable, avail themselves in the Evening Classes of the Municipal Technical School of the services of the Assistant Science Masters in the Board's new Central Day School, thus securing continuity in instruction and the interest of these teachers in the welfare of the two Institutions.

Day Technical Department in Commercial Knowledge and Domestic Economy.

13. The foregoing arrangements are not to exclude the Technical Instruction Committee from teaching Foreign Languages in the Day Technical Departments, nor from the establishment, if deemed desirable, of an advanced Technical Department in Commercial Knowledge for day students of fifteen years of age and upwards, nor from the continuance and development of the present Domestic Economy Classes for Women, special and exclusive provision being made for teachers desirous of obtaining certificates from examining bodies; but such Domestic Economy Courses are to be arranged so as not to be in competition with the School Board's Evening Institutes for Women and Girls.

Situation of the new Central School.

14. It is desirable, if possible, that the new Central School be erected in the immediate vicinity of the new Municipal Technical School in Whitworth-street and Sackville-street.

Syllabuses of Instruction.

15. The Syllabuses issued respectively by the School Board and by the Technical Instruction Committee shall be the subject of joint consideration and agreement, and be issued simultaneously, and each, as the case may be, shall refer to the work of the School Board or the Technical Instruction Committee. The monthly periodical styled "The Evening Student" shall embrace the work of both Institutions, and be, as far as possible, the organ of both.

Commencement of operation of the scheme.

16. The School Board being under the necessity of providing accommodation for the work now carried on in the Central School in Deansgate within eighteen months from the present time, the foregoing arrangements shall come into effect for the Session 1897-98—that is to say, twelve months before the new Technical School is ready for occupation.

The students in Science and Art now attending the Central School Evening Classes shall be accommodated in the Municipal Technical School in the rooms vacated by the Commercial Classes now carried on therein.

(Signed)

EDWARD C. MACLURE, D.D., Dean of Manchester, Chairman C. H. WYATT, Clerk	*On behalf of the School Board for Manchester.*
JAMES HOY, Chairman J. H. REYNOLDS, Director and Secretary	*On behalf of the Technical Instruction Committee of Manchester.*

Manchester, December 19th, 1895.

At a meeting of the Representatives of the Manchester School Board and the Technical Instruction Committee, held on Friday, December 27th, 1895, at the Offices of the School Board, it was

Resolved,—

That the Scheme of the Sub-Committee as amended be adopted.

Resolved,—

That a Copy of the Scheme be sent to every Member of the School Board and to every Member of the Technical Instruction Committee.

(Signed) C. H. WYATT, J. H. REYNOLDS, *Joint Secretaries.*

December 27th, 1895.

Resolved,—

That a print of the report be forwarded to each Member of the City Council, and to the Press, prior to its next Meeting.

On behalf of the Committee.

(Signed) JAMES HOY, *Chairman.*

Town Hall,

2nd January, 1896.

V.

Document put in by Arnold Graves, Esq., B.A., Secretary to the Commissioners of Charitable Donations and Bequests for Ireland.

TABLE of existing IRISH TRADES likely to be benefited by the extension of Technical Instruction.

(See the Evidence of Mr. Arnold Graves, q. 5732.)

Trade.	Number following Trade.	Trade.	Number following Trade.
Linen Manufacturers,	88,503	Bookbinders,	1,853
Woollen Trade,	6,338	Weavers,	1,823
Cotton Trade,	2,331	Ship Carpenters,	1,430
Carpenters,	23,668	Miners,	1,382
Bootmakers,	21,353	Brewers,	1,367
Tailors,	16,113	Plasterers,	1,872
Blacksmiths,	13,569	Maltsters, Distillers,	1,031
Fishermen,	11,278	Braziers,	700
Bakers,	8,931	Basketmakers,	667
Masons,	7,058	Wood Turners,	625
Painters, Glaziers,	6,065	Lithographers,	598
Printers,	4,366	Jewellers,	406
Coopers,	4,253	Glass Manufacturers,	358
Ship and Boat Builders,	2,587	Silk Weavers,	369
Stone-dressers,	2,556	Paper Makers,	213
Bricklayers	3 380	Sail Makers,	184
Cabinetmakers,	2,096	Coppersmiths,	159
Plumbers,	2,140	Wood Carvers,	59
Coachmakers,	1,989	Soapmakers,	69
Tin Workers,	1,925		

VI.

Document put in by W. Macneile Dixon, Esq., Litt. D., Professor of English Language and Literature in the University of Birmingham.

MEMORANDUM submitted to the ROYAL COMMISSION.

(See the Evidence of Professor Macneile Dixon, q. 6790.)

The federal type of University, unobjectionable, perhaps in a country like Wales, is peculiarly unsuited to Ireland. In theory, perhaps, attractive, experience has little to say in its favour. Victoria University has within it the seeds of disruption, and it may fairly be assumed that the future in this country is with the University of the German or Scottish type. After exhaustive discussion, before the establishment of a University in Birmingham, the federal type was rejected. In the case of Ireland the ideals and requirements of North and South are so dissimilar as to render entirely nugatory any attempt to provide for their necessities in the same institution.

What, then, is needed? I believe institutions preserving University standards, and ministering to local necessities. British Universities may be classified under two heads—national and provincial. Among the characteristics of the national type may be noted:

(*a.*) That they are aristocratic in government, that is, managed by an exclusive guild of experts indifferent to popular criticism.

(*b.*) That they preserve the highest possible standards.

(*c.*) That they are *self-contained*, *i.e.*, capable of supplying themselves with teachers without external assistance.

(*d.*) That they are capable of advancing knowledge, by reason of the number of teachers in each subject, and of providing instruction in special departments of each subject.

(*e.*) That they are concerned rather with knowledge for its own sake than with the applications of knowledge to local requirements, and train their students for national rather than provincial ends.

(*f.*) That their geographical position does not affect their *curricula*.

Oxford, Cambridge, and Dublin seem to be the only Universities in the British Islands which fulfil all these requirements, *e.g.*, satisfy the demand made by Clause (*c.*). Trinity College, Dublin, seems to be doing national work, and should, therefore, welcome all comers, irrespective of creed.

Among the characteristics of the provincial type of University may be noted:—

(*a.*) That their form of government is democratic, and that they are thus in close contact with the local community to which they minister.

(*b.*) That they attempt to bring national and international standards of knowledge to local centres.

(*c.*) That they provide for local needs, and thus do work impossible for Universities of the national type. In the University of Birmingham, there exists, for example, a flourishing School of Brewing, and a School of Commerce is in process of organisation. A clause from the last report of the Professor of Brewing well displays the character of much of the practical work which can be done only by Provincial Universities:—"I should like to record the kindness of Messrs Showell, Messrs Frederick Smith, and Messrs. Thomas Salt & Co., of Burton, in allowing my students and myself, on various occasions, both last session and this, to visit their maltings and breweries."

Universities of the provincial type *may* be "full" Universities, embracing all the usual faculties, or they may be Universities of one or two faculties.

The term University is strictly applicable to the latter class, and, in no sense, implies a place of "universal" learning. It was applied in mediæval times to Salerno and Bologna, Universities concerned with limited groups of studies. To the general misunderstanding respecting the true scope and character of University institutions must, in part, be ascribed the sadly belated effort to meet the educational requirements of this country. Ireland seems to require local faculties of University rank, doing work of a University standard.

But the form of government should be *democratic*, for many reasons, *e.g.*:—

1. The burden of responsibility for their success is thrown on the community to which they minister.
2. The institutions themselves benefit from the local knowledge and local patriotism of their Governors.
3. Dependent, in considerable measure, upon the financial support of the district to which they belong, they are necessarily active and progressive societies.

With these preliminaries I would venture to suggest that the University problem in Ireland might be dealt with in the following way:—

The appointment of a permanent University Commission of four or five persons, independent of all the Colleges concerned.

The establishment of two Universities under the Commission—a Catholic University in Dublin, and a Queen's University in Belfast.

The Catholic University would be governed by a *Court* of (in the first instance) 200 or 250 persons, the Roman Catholic Bishops, together with Roman Catholic noblemen and gentlemen. This body would connect the University with the intellectual life of Roman Catholic Ireland, and would act as an *Advisory Board* to the Commission.

An *Executive Committee or Council* would consist of, say (in the first instance):—

The Chancellor, being the Roman Catholic Archbishop of Dublin, and four Roman Catholic Bishops.

Ten persons nominated by the Court from among their members.

Five persons elected by and representing the teaching staff.

This body reporting to the Court would manage finance, and review the action of the Senate or Academic body, consisting of heads of departments, and managing education and discipline. Eventually the graduates should have five representatives upon the Executive Committee or Council. These three bodies,—the *Court*, the *Council*, and the *Senate*—would keep the institution in touch with society at large, with its own past members, and with professional and expert opinion. Its finance would be in the hands of practical men, its education and discipline in those of scholars.

Appeals on questions of faith or morals should be decided by the Chancellor.

The appointment of Professors and teachers should be made by the Executive Committee or Council on the nomination of the Senate.

The University would necessarily be confined to persons professing the Roman Catholic religion. It is asked for by them, and the graduates would eventually have a large share in its government, and the direction of its policy. It would seem improper also to admit students who could never become members of its governing body, or could do so only to introduce discord into its guiding principles. The fees, moreover, of such an University, if it is to prove of any real benefit to the Roman Catholics of Ireland, would necessarily be low, and, if Protestants were admitted, it would enter into unfair competition with Trinity College, Dublin, a rivalry which, in the judgment of those who know Ireland, would hardly promise to be healthy.

The Court would act as the advisory body of the Commission, which would, on report to Parliament, provide the grants necessary for the establishment of such faculties as could be maintained at the highest University level.

In the first instance, these might be only two or three. Teaching might be provided in other departments, as "culture subjects," are provided for in a German Polytechnic; but students in such incomplete or weak faculties would require to submit themselves to external tests, *i.e.*, to satisfy the external Examiners appointed by the Commission. If it were possible to bring it about, the University of London might establish examination centres in Ireland, and thus provide for the students of these faculties the tests of a well-known standard. The University of London would thus become the only examining University in the British Isles, a consummation devoutly to be wished.* Students in fully-equipped faculties would be examined by their own teachers, and by external Examiners appointed by their own University authorities.

Queen's College, Belfast, would be reconstituted as the Queen's University, governed by a local *Court* of, in the first instance, 200 or 300 persons, and eventually enlarged to include a large representation of graduates.

As in the case of the Catholic University, an Executive *Committee* or *Council* would manage finance, and review the acts of the Senate concerned with education and discipline. The Council should contain representatives of the Municipal Council.

Such faculties as were of University standard would be independent of the Commission, and would examine their own students, with the assistance of external Examiners appointed by the University, through the Senate or academic body. The students of other faculties would submit to external tests. The departments of Applied Science would be managed by Advisory Boards, consisting of the teachers in the department, and other persons appointed by the Council, on account of their special practical knowledge. *E.g.*—The Department of Commerce would be strengthened by the presence on the Board of one or two leading merchants. Courses of lectures might even be given from time to time by local persons officially unconnected with the University. The Town Clerk of Birmingham recently gave a course of interesting lectures in the University upon *Taxation*.

The acts of the faculties or departments would, however, be submitted to the Senate.

New faculties might from time to time be added to either University when the Commission was satisfied with the endowment, equipment, and staff. Local efforts on its behalf would be an important means of estimating its prospect of success.

State support to a provincial institution should invariably be proportioned to the interest displayed in it by the district to which it belongs as evinced by local endowment.

The possibility of striking a side blow at Trinity College, Dublin, by the establishment of a weak faculty, *e.g.*, in Arts, should be borne in mind, lest in the effort to extend and improve University Education in Ireland, one of its chief supports might suffer. Both the Roman Catholic University and Queen's University should require residence, *i.e.*, attendance upon lectures, from all students, and the classes in both should be open to women.

I would venture to suggest that the endowment of Alexandra College, and its affiliation to the University of Dublin, would provide for all the women seeking University Education, not provided for by the Roman Catholic University and Queen's University.

The financial requirements of these Universities, together with those of the Queen's Colleges at Cork and Galway, would be considered every five years, after inspection by the Commission or persons appointed by Parliament.

I may add that, in my opinion, the University problem should be treated as part of the general educational problem in the country.

W. MACNEILE DIXON.

* If this proved impracticable the University of Dublin might provide for such students external examinations of the necessar University standard.

VII.

Documents put in by the Right Reverend Monsignor Molloy, D.D., D.Sc., Rector of the Catholic University of Ireland.

(1.)

THE GOVERNING BODY OF THE CATHOLIC UNIVERSITY SCHOOL OF MEDICINE.

Incorporated under the Educational Endowments (Ireland) Act, 1885.

(See the Evidence of Monsignor Molloy, q. 6633, p. 152.)

Ex-Officio Members.

1. Most Rev. William J. Walsh, D.D., Archbishop of Dublin, Chairman.
2. Right Rev. Gerald Molloy, D.D., D.Sc., Rector of the Catholic University, Vice-Chairman.
3. Sir Christopher Nixon, LL.D., M.D., F.R.C P.I., Dean of Faculty.
4. Very Rev. Robert Carbery, Dean of Residence.

Representatives of the Faculty.

5. Patrick J. Hayes, M.D., M.R.C.E., F.R.U.I.
6. Ambrose Birmingham, M.D., F.R.U.I., F.R.C.S.I.
7. D. J. Coffey, M.A., M.B., F.R.U.I.

Representatives of Medical Science.

8. Thomas More Madden, M.D., F.R.C.S.E.
9. Richard F. Tobin, F.R.C.S.I.
10. Joseph F. O'Carroll, M.D., F.R.C.P.I.

Representative of the Bishops.

11. Most Rev. John Healy, D.D., Bishop of Clonfert.

MEDICAL FACULTY.

Sir C. Nixon, M.D., Dean.
Patrick J. Hayes, M.D.
Charles Coppinger, M.D.
Antony Roche, M.R.C.P.I.
Alfred J. Smith, M.B., M.A.O.
E. J. M'Weeney, M.D.
Denis J. Coffey, M.B.
Hugh Ryan, D.Sc.
M. J. Dempsey, M.D.
Ambrose Birmingham, M.D. (Registrar).

(2.)

TEACHING STAFF OF THE CATHOLIC UNIVERSITY SCHOOL OF MEDICINE.

(See the Evidence of Monsignor Molloy, q. 6633, p. 154.)

ANATOMICAL DEPARTMENT.

A. Birmingham, M.D., B.CH., B.A.O., Irel., F.R.C.S.I., L.R.C.P.I., Fellow and Examiner in Anatomy, Royal University, Ireland; Examiner in Anatomy, University of Cambridge, and Royal College of Surgeons and Conjoint Board, R.C.P. and R.C.S., Ireland; Past President, Anatomical and Physiological Section, Royal Academy of Medicine, Ireland; Past Vice-President and Secretary, Anatomical Society of Great Britain and Ireland; Author of "The Digestive System" in Cunningham's Text-Book of Anatomy; Joint Author of the anatomical section of MacNaughton-Jones's Diseases of the Ear; Author of numerous papers on anatomical subjects in the *Journal of Anatomy and Physiology.*

Demonstrators of Anatomy.

P. J. Fagan, F.R.C.S.I., Surgeon to St. Vincent's Hospital, Extern Department.

Geo. M. Keating, B.A. (in Biology), R.U.I., M.B., B.CH., B.A.O., R.U.I., F.R.C.S.I., Winner of Travelling Medical Scholarship in Anatomy, &c., R.U.I.

PHYSIOLOGICAL DEPARTMENT.

Emeritus Professor.

Charles Coppinger, F.R.C.S.I., M.D., M.CH. (*Hon. Causa*), R.U.I.; Surgeon to the Mater Misericordiæ Hospital; Consulting Surgeon to St. Michael's Hospital, Kingstown; Examiner in Physiology, Royal College of Surgeons, Ireland.

Professor.

Denis J. Coffey, M.A., M.B., B.CH., B.A.O.; Ex-University Student in Biology, Fellow and Examiner in Physiology, Royal University, Ireland; Lecturer on Physiology and Biology, St. Patrick's College, Maynooth, and Royal Veterinary College of Ireland; Author of paper on "The structure of the Oesophagus" and a paper on the "Origin of the hypo-glossal nerve"; worked in the laboratories of Louvain, Marburg, Munich, Leipzic, and Madrid.

Demonstrator of Histology.

Michael Curran, M.A. (in Biology), M.B., B.CH., B.A.O., R.U.I. (with first place First Honours and First Exhibition).

DEPARTMENT OF CHEMISTRY.

Hugh Ryan, M.A., D.Sc., Ex-University Student in Chemistry, Gold Medallist, Fellow, and Examiner in Chemistry, Royal University of Ireland; Author of several papers on advanced Chemical subjects, including "The Galactosides," "The Glucosides," and "The Amido-Ketones."

Assistant to the Professor.

Geo. Ebrill, B.A. (in Chemistry and Physics), R.U.I.

DEPARTMENT OF SURGERY.

Patrick J. Hayes, F.R.C.S.E., M.D., M.CH. (*Hon. Causa*), R.U.I.; Senior Surgeon, Mater Misericordiæ Hospital; Consulting Surgeon, St. Michael's Hospital, Kingstown; Visiting Surgeon, St. Patrick's College, Maynooth; Fellow and Examiner in Surgery, Royal University of Ireland; Consulting Surgeon, St. Joseph's Children's Hospital, Temple-street; Author of several papers on surgical subjects, printed in the transactions of the Royal Academy of Medicine, Ireland, and elsewhere.

Assistant to the Professor.

John S. M'Ardle, F.R.C.S.I., Surgeon to St. Vincent's Hospital; Member of Council R.C.S.I.; Author of "A Manual of Operative Surgery," and of several papers on surgical subjects.

MEDICINE.

Sir Christopher Nixon, M.D. (*Hon. Causa*), R.U.I., A.B., M.B., LL.D., Univ. Dub.; Fellow, R.C.P.I.; Licentiate, R.C.S.I.; Senior Physician to the Mater Misericordiæ Hospital; Member of Senate of Royal University of Ireland; Member of General Medical Council; Visiting Physician to St. Patrick's College, Maynooth; Consulting and Visiting Physician

to the Central Asylum, Dundrum; President of the Royal College of Physicians in Ireland; Author of "A Handbook of Hospital Practice and Physical Diagnosis," and of numerous papers on medical subjects printed in the *Dublin Journal of Medical Science*.

MIDWIFERY AND DISEASES OF WOMEN.

Alfred J. Smith, M.B., M.CH., M.A.O. (Irel.), F.R.C.S.I., L.M.R.C.P.I.; Examiner in Midwifery, &c., Royal University, Ireland; late Examiner in Midwifery, Royal College of Surgeons and Conjoint Board, R.C.P., and R.C.S., Ireland; Ex-Assistant Master, Rotunda Hospital, Dublin; Gynæcologist, St. Vincent's Hospital, Stephen's-green; Fellow and Member of Council, British Gynæcological Society, London; Author of "Report of the Rotunda Gynæcological Department for 1887," "Report of Abdominal sections performed in the Gynæcological Ward of St. Vincent's Hospital," and of numerous papers on Gynæcological subjects.

DEPARTMENT OF PATHOLOGY AND BACTERIOLOGY.

Edmond J. M'Weeney, M.A., M.D., M.CH., M.A.O., M.R.C.P.I.; Ex-Scholar and University Student, R.U.I.; Examiner in Pathology, Royal University of Ireland; Pathologist, Mater Misericordiæ, Coombe, and the National Lying-in Hospitals; Bacteriologist to the Local Government Board, Ireland; President of the Pathological Section of the Royal Academy of Medicine in Ireland; Author of "Introduction to Chemical Methods of Clinical Diagnosis, with an appendix on Micro-Biological Methods," and of numerous papers on bacteriological and botanical subjects.

DEPARTMENT OF MATERIA MEDICA AND PHARMACY.

Martin J. Dempsey, B.A., M.D. (with Gold Medal), B.CH., B.A.O., R.U.I.; Fellow, Royal College of Physicians, Ireland; Examiner in Materia Medica, Royal University; Physician, Mater Misericordiæ Hospital.

Assistant to the Professor.

Lewis More-O'Ferrall, F.R.C.S.I., L. & L.M.R.C.P.I., Physician to the Children's Hospital, Dublin.

DEPARTMENT OF MEDICAL JURISPRUDENCE AND HYGIENE.

Antony Roche, M.R.C.P.I., L.M., L.R.C.S.I.; Fellow of the Sanitary Institute of London; Member of the Society of Public Analysts; Examiner in Medical Jurisprudence and Hygiene, Royal University, Ireland; Author of English edition of "The Imperial Health Manual," and of several papers on public health matters.

DEPARTMENT OF OPHTHALMOLOGY.

Louis Werner, B.A., M.B., B.CH., F.R.C.S.I.; Ophthalmic Surgeon, Mater Misericordiæ Hospital; Examiner in Ophthalmic and Aural Surgery, Royal University; Assistant Surgeon, National Eye and Ear Infirmary, Molesworth-street; Author of several papers on Ophthalmological subjects, and joint author of one edition of "Swanzy's Ophthalmology."

DEPARTMENT OF BIOLOGY.

Biology.

George Sigerson, M.D., M.CH., F.R.U.I., L.R.C.P.I., M.R.I.A.; Examiner in Biology, Royal University of Ireland; Fellow of the Linnæan Society, London; Member of the Anthropological and Clinical Societies, Paris; and of the Scientific Society, Brussels.

Practical Biology (R.U.I. Course).

Alexander J. Blayney, M.A., M.B., B.CH., B.A.O. (with First Place, First Honours, and First Exhibition), F.R.C.S.I.; Ex-University Student in Biology; Examiner in Biology, Royal University, Ireland; Assistant Surgeon to the Mater Misericordiæ Hospital.

Elementary Biology.

Denis J. Coffey, M.A. (in Biology), M.B., B.CH., B.A.O.; Winner of University Studentship, R.U.I.; Lecturer on Biology, St. Patrick's College, Maynooth.

DEPARTMENT OF PHYSICS.

Natural Philosophy (R.U.I. Course).

J. A. M'Clelland, M.A., B.Sc. Cambridge, (for research work); Fellow and Examiner in Natural Philosophy, Royal University of Ireland; late Junior Fellow (by examination), R.U.I.; and late 1851 Exhibition Research Scholar at Owen's College, Manchester.

Elementary Physics.

P. J. Fagan, Fellow and Licentiate, R.C.S.I.; L. and L.M.R.C.P.I.; Surgeon to St. Vincent's Hospital, Dublin (Extern Department).

DEPARTMENT OF DENTISTRY.

Kevin E. O'Duffy, L.D.S., R.C.S.E.; Dental Surgeon to St. Vincent's Hospital, Dublin; Lecturer on Mechanical Dentistry, and Assistant Dental Surgeon, Dental Hospital, Ireland; President, Dental Students' Society of Ireland.

(3.)

SCHEME framed under the Educational Endowments (Ireland) Act, 1885, for the GOVERNMENT and MANAGEMENT of the CATHOLIC UNIVERSITY SCHOOL of MEDICINE, in the City of Dublin, and approved by Order in Council, dated 24th May, 1892.

(See the Evidence of Monsignor Molloy, q. 6647.)

Whereas, in or about the year 1855, a School of Medicine was established by the Roman Catholic Bishops of Ireland, at St. Cecilia-street, in the city of Dublin, and has since been carried on there, under the name of the School of Medicine of the Catholic University of Ireland:

And whereas the site and buildings of the said school, more particularly described in the first schedule hereto, are held under the indenture of lease dated May 23, 1838, in the first schedule mentioned, and are now vested in the Most Rev. Thomas W. Croke, D.D., Archbishop of Cashel, as the surviving trustee thereof, for the purposes of the said school:

And whereas Hugh Blayney, late of No. 32, Eccles-street, in the city of Dublin, deceased, by his will dated May 26, 1877, bequeathed to the trustees and executors named therein certain "Shares in the Bank of Ireland," in trust to pay over the dividends or annual profits of five of such shares to the Roman Catholic University, St. Stephen's-green, Dublin; and the said bequest is now represented by the sum of five hundred pounds Stock of the Bank of Ireland, standing in the name of the Accountant-General of the High Court of Justice in Ireland, more particularly described in the Second Schedule hereto, Part I., and the dividends thereon are now payable to the Right Rev. Gerald Molloy, D.D., as Rector of the said University:

And whereas the Roman Catholic Bishops of Ireland, being the governing body of the said University, have by resolution passed at a meeting held on June 25, 1891, determined that the annual income derived from the said sum of five hundred pounds Stock of the Bank of Ireland shall be applied to the purposes of the said School of Medicine; subject to the condition that if at any time, in their opinion, all or any part of the said income shall be no longer required for the purposes of the said School, or cannot be beneficially applied thereto, they may direct that it shall be applied to any other purpose connected with the said University:

And whereas the said Bishops have, by resolution passed at the aforesaid meeting, determined to apply to the purposes of the said School of Medicine a sum of one thousand pounds, being part of a bequest left to the said University by the late Patrick Lynch, M.D., of Belfast, which sum is more particularly described in the Second Schedule hereto, Part II.:

And whereas, in consideration of a sum of five hundred pounds heretofore expended by the said Bishops upon the improvement and equipment of the said School of Medicine, an arrangement has been made with the Medical Faculty of the said School that two students should receive free lectures each year in the said School:

And whereas the said site and buildings, and the income from the said Bank of Ireland Stock, and the said sum of one thousand pounds, now constitute educational endowments within the meaning of the Educational Endowments (Ireland) Act, 1885; and the Roman Catholic Bishops of Ireland, being the governing body of the said Catholic University and of the said School of Medicine, have intimated in writing to the Commissioners under the said Act, their consent that the said endowments shall be dealt with under the said Act:

And whereas it has appeared to the Commissioners under the said Act, after due inquiry, that, in order to extend the usefulness of the said several endowments, provision should be made for the future government and management of the said School of Medicine and of the said endowments, in the manner hereinafter appearing:

Therefore, from and after the date of this scheme, being the day upon which the Lord Lieutenant shall by Order in Council declare his approbation thereof, the said endowments shall be held, governed, managed, and applied for the purposes, with the powers, under the conditions and provisions, and in the manner hereinafter set forth, and not otherwise, any previous Act of Parliament, Letters Patent, Statute, Charter, Deed, Will, Instrument, Scheme, Trust, or Direction relating to the subject-matter of this scheme, to the contrary notwithstanding.

Preliminary.

Interpretation of Terms.

1. For the purposes of this scheme, unless the context otherwise requires, the following terms shall be interpreted as follows:—

"The Act" shall mean the Educational Endowments (Ireland) Act, 1885.

"The School" shall mean the School of Medicine founded by the Roman Catholic Bishops of Ireland, and now carried on at St. Cecilia-street, in the city of Dublin, and known as the School of Medicine of the Catholic University of Ireland.

"The Governors" shall mean the governing body of the School, as hereby incorporated.

"The Endowments" shall mean and include all the lands, buildings, tenements, hereditaments, moneys, stocks, chattels, and effects mentioned in the several schedules hereto, and all the rents, interest, dividends, and income thereof, due and accruing; and shall also include all or any other property, real or personal, which shall hereby, or may at any time hereafter, become or be vested in the governors for all or any of the purposes of this scheme.

"The Catholic University" shall mean the institution founded by the Roman Catholic Bishops of Ireland in or about the year 1854, and known as the Catholic University of Ireland.

"The Bishops" shall mean the Roman Catholic Archbishops and Bishops of Ireland for the time being.

"The Faculty" shall mean the Medical Faculty of the School, for the time being, as constituted under the provisions of this scheme.

"The Dean of Faculty" shall mean the person elected to act as Chairman of the Faculty, as hereinafter provided.

"The Dean of Residence" shall mean the person appointed, under the provisions of this scheme, to have charge of the moral and religious conduct of the students of the School.

The Governing Body.

Incorporation of Governing Body.

2. From and after the date of this scheme, a governing body shall be formed in the manner following, for the future management of the School and of the endowments.

It shall consist of four *ex-officio* governors, and seven representative governors.

The *ex-officio* governors shall be the Roman Catholic Archbishop of Dublin; the Rector of the Catholic University; the Dean of Faculty; and the Dean of Residence; all for the time being.

One representative governor shall be appointed by the Bishops, as hereinafter provided, and shall be known as the representative of the Bishops; three representative governors shall be elected from their own body by the Faculty, and shall be known as the representatives of the Faculty; and three representative governors shall be appointed by the Bishops, from persons of distinction in the Medical profession, not members of the Faculty, and shall be known as the representatives of Medical Science.

At the first meeting of the Bishops after the date of this scheme, they shall appoint a governor who shall be their representative, and they shall determine the period for which he shall hold office. In making this appointment, and in carrying out the other provisions of this scheme, the Bishops shall proceed according to the rules for the time being regulating the ordinary business of their meetings.

The representatives of the Faculty shall, in the first instance, be such and so many of the following persons as, at the date of this scheme, shall be qualified, able, and willing to act as governors:—

1. Francis J. B. Quinlan, M.D., F.R.C.P.I.
2. Patrick J. Hayes, M.D., F.R.C.S.E.
3. Ambrose Birmingham, M.B., B.CH.

The representatives of Medical Science shall, in the first instance, be such and so many of the following persons as, at the date of this scheme, shall be qualified, able, and willing to act as governors:—

1. Francis R. Cruise, M.D., F.R.C.P.I.
2. Thomas More Madden, M.D., F.R.C.S.I. EDIN.
3. Richard F. Tobin, A.M.S., F.R.C.S.I.

The governors for the time being shall constitute a body corporate, by the name of "The Governors of the Catholic University School of Medicine," with perpetual succession and a common seal, and power to acquire and hold property, real and personal, for the purposes of this scheme.

Representative of the Bishops.

3. Whenever the representative of the Bishops shall cease to hold office, they shall appoint a suitable person to fill the vacancy; and they shall, from time to time, determine the period for which their representative shall hold office. Until the first appointment of the representative of the Bishops, the above-named *ex-officio* and representative Governors shall constitute the governing body, and shall be capable of exercising all the powers of the Governors.

Representatives of the Faculty.

4. One representative of the Faculty shall go out of office on the thirty-first day of October first happening more than twelve months after the date of this scheme, and on every succeeding thirty-first day of October. In the same month of October, the Faculty shall elect one of their number to be a representative Governor. Each representative Governor, so elected, shall enter upon office on the first day of November following his election, and shall hold office for three years, or until he shall vacate office as hereinafter provided. The order in which the first-named representatives of the Faculty shall go out of office shall be determined by lot. Every outgoing representative of the Faculty, being otherwise qualified, shall be eligible for re-election.

Representatives of Medical Science.

5. One representative of Medical Science shall go out of office on the thirty-first day of October first happening more than twelve months after the date of this scheme, and on every succeeding thirty-first day of October; and at their meeting in the same month of October or in some preceding month, as the Bishops shall, from time to time, determine, the Bishops shall appoint a qualified person to take his place. Each Representative Governor so appointed shall enter upon office on the first day of November following his appointment, and shall hold office for three years, or until he shall vacate office as hereinafter provided. The order in which the first-named Representatives of Medical Science shall go out of office shall be determined by lot. Every outgoing Representative of Medical Science, being otherwise qualified, shall be eligible for re-appointment.

Casual Vacancies.

6. Whenever any Representative Governor shall die, or resign by writing under his hand, or refuse to act, or become incapable of acting, or, being a Representative of the Faculty, shall become the Dean of Faculty, his office shall thereupon become vacant; and the fact of the vacancy, with the cause thereof,

shall be recorded in the minutes of the Governors; and as soon as conveniently may be after the occurrence of each vacancy, the Bishops, or the Faculty, as the case may be, shall appoint or elect a duly qualified Governor to fill the vacancy. Every Governor so appointed or elected in the place of a Representative Governor shall hold office only so long as the Governor in whose place he shall have been appointed or elected might have held the same.

Vesting and Transfer of the Endowments.

Vesting and Transfer of the Endowments.

7. From and after the date of this scheme, the school buildings and premises described in the First Schedule hereto shall, without any new conveyance or instrument, be transferred to and vested in the Governors, and shall be thenceforth held by them and their successors for ever, upon and for the trusts and purposes of this scheme, subject to the conditions and provisions herein contained, and to all such rents, charges, rights, easements, and liabilities as, at the date of this Scheme, may lawfully affect the same. From and after the date of this scheme all property, securities, goods, chattels, and moneys held by any person or persons (other than the Accountant-General of the High Court of Justice in Ireland), in trust for, or applicable to the purposes of the School, shall be delivered, transferred, and paid by the person or persons possessed thereof, or bound to pay the same, to the Governors; and the receipt of the Governors, duly executed as hereinafter provided, for any transfer, delivery, or payment hereby directed, shall be a good discharge for the person or persons making the same, and he or they shall thenceforth not be answerable for the application thereof.

From and after the date of this scheme, all such parts of the endowments as shall be then standing in the name of the Accountant-General of the High Court of Justice in Ireland, subject to the orders of the said High Court, shall be held for the purposes of this scheme; and the dividends, interest, and income thereof, subject as aforesaid, shall be payable to the Governors, and shall be applied by them as hereinafter directed. Provided that the Bishops may at any time, and from time to time, by resolution, direct that all or any part of the said dividends, interest, and income which, in their opinion, shall be no longer required for the purposes of the School, or cannot be beneficially applied thereto, shall be applied for any other purpose connected with the Catholic University, and the same shall thenceforth be applied accordingly. Provided also that the Governors, with the previous sanction of the Bishops, but not otherwise, may apply to the said High Court for a transfer of the said endowments, or any part thereof, to the Governors, and the same may thereupon be so transferred accordingly.

Immediately after the date of this scheme the Governors shall apply to the executors of the will of Patrick Lynch, M.D., for payment of the sum of one thousand pounds, mentioned in the Second Schedule hereto, Part II., and the said executors may pay the said sum to the Governors accordingly. From and after such payment, the Governors shall hold the said sum, and the investments and accruing and future interest dividends and income thereof, after payment of any necessary expenses, upon trust to apply the same for the trusts and purposes, and in accordance with the conditions and provisions, of this scheme.

Trusts of the Endowments.

Trusts of the Endowments.

8. From and after the date of this scheme all the property of or belonging to the Governors, or available for the purposes of this scheme, shall be received and held by them upon trust to maintain the School of Medicine of the Catholic University of Ireland, in accordance with the conditions and provisions herein contained.

Application of the Endowments.

Application of the Endowments.

9. All moneys received by the Governors under or for the purposes of this scheme, shall, subject to the other provisions herein contained, and to any special trusts or conditions upon which any part thereof may be received, be expended and applied by them for the following purposes, or for such and so many of them as to the Governors shall, from time to time, seem expedient:—

(*a.*) To maintain the buildings and premises, the furniture, appliances, laboratories, museums, and collections, belonging to the School, in good order and condition; and to make such additions thereto, and such improvements therein, as may be required from time to time.

(*b.*) To pay all rents, taxes, cost of insurance, and other charges necessarily or properly payable out of or for the said premises, and to defray the necessary working expenses of the School, and the cost of management.

(*c.*) To provide for the education of the students, and for this purpose to pay such Professors, Lecturers, and other teachers as may from time to time be engaged for the instruction of students in the School.

(*d.*) To provide Exhibitions and other prizes for the most deserving students; such Exhibitions and prizes may be awarded in the form of free lectures, or in such other manner as may seem best calculated to stimulate the industry and promote the progress of the students.

(*e.*) To defray any other expenses incurred in carrying out the provisions of this scheme.

Additional Endowments.

Donations and Bequests.

10. The Governors may collect, receive, acquire, and hold donations, devises, bequests, subscriptions, and other additional endowments, real or personal, and may apply the same to all or any of the purposes of this Scheme. They may also receive, acquire, and hold donations, devises, bequests, subscriptions, and other endowments, real or personal, and may apply the same for any object connected with all or any of the purposes of this scheme, which shall not be inconsistent with, or calculated to impede, the efficient working of the provisions hereof. All property and moneys so received or applied shall be included in the accounts to be kept by the Governors under this scheme.

Aid from Public Sources.

11. The Governors may do any acts, and may make any arrangements, from time to time necessary, to enable them to obtain for the School, from any public body, such aid as may at any time be available for or open to like schools or the students thereof; and they may, notwithstanding anything herein contained, place the School, or any or all of the classes or students thereof, in connection with, or under the inspection of, any such public body as aforesaid; and they may comply with any rules or regulations for the time being in force respecting schools or students receiving such aid. All money and other aid which the Governors may so receive shall, subject to such rules and regulations, be applied by them in conformity with the provisions of this scheme, and accounted for accordingly.

The School Premises.

The School Premises.

12. The School may be carried on in the premises hitherto occupied thereby, or it may be removed to some other convenient site in or near the city of Dublin. In case of such removal, the buildings and premises vacated, if no longer required for the purposes of the School, shall be sold, let, or otherwise disposed of, to the best advantage. Provided that no such removal shall take place, nor shall any agreement for the same, or for any letting, sale, or other disposal of the existing School premises, be made or entered into by the Governors, or become binding upon them, without the previous sanction of the Bishops; and such sanction shall not be given unless and until the Bishops shall have satisfied themselves, upon due inquiry, that such removal or disposal is for the benefit of the School.

General Provisions as to Governing Body.

Chairman, *Quorum* and Honorary Officers.

13. The Archbishop of Dublin shall be the Chairman, and the Rector of the Catholic University shall be the Vice-Chairman, of the Governors. The Chairman shall preside at all meetings of the Governors at which he is present; in the absence of the Chairman the Vice-Chairman shall preside; and in the absence of both, the Governors present shall elect one of their number to preside for the occasion. Five Governors shall constitute a *quorum*, and all matters and questions shall be determined by the majority of the Governors present; in every case of equality of votes, the presiding Governor shall have a second or casting vote. The Governors may appoint an Honorary Secretary, and such other honorary officers as they shall think fit.

Meetings.

14. Within two calendar months after the date of this scheme, and three times at the least in every year thereafter, twice in the winter session and once

in the summer session, the Governors shall meet at the School; they may also meet at such other times and places as they may from time to time appoint. At each of the meetings held at the School, the Governors shall examine for themselves the condition of the buildings, furniture, and appliances, of the School; they shall also inspect the Minute Book of the Faculty, the Attendance Book containing the record of the lectures and attendances of the teaching staff, and the Class Rolls of the students. Notice of every meeting shall be given to each Governor three clear days, or such other time as the Governors may direct, before the meeting. The Chairman, or the Vice-Chairman, or any five other Governors, may at any time summon a special meeting, giving notice to each Governor six clear days, or such other time as the Governors may direct, before the meeting, and specifying in such notice the object thereof. Every meeting may adjourn for the completion of its business to such time and place as the Governors present shall appoint.

Minutes, Books and Documents.

15. Every Governor shall, at or before the first meeting which he attends, sign a declaration, in a book to be kept for that purpose, of his acceptance of the office of Governor, and until he has signed such declaration he shall not be entitled to act as a Governor. Minute books shall be kept by the Governors, in which minutes of all their proceedings shall be duly entered. All deeds and other writings sealed with the common seal, and signed at any meeting of the Governors by the Chairman of the meeting and two other Governors, shall be held to be validly executed on behalf of the Governors.

Committees

16. The Governors may, from time to time, appoint a Committee or Committees, each consisting of any two or more of their number, to visit the School, to carry into execution such orders, rules, or regulations, with respect to the purposes of this scheme, as the Governors may direct, or to manage such other business as the Governors may deem it expedient to depute to them. The Governors may fix the *quorum*, define the duties, and regulate the proceedings of every Committee as they shall think fit.

By-laws and Regulations.

17. The Governors may, from time to time, make such by-laws and regulations as they shall consider convenient and needful for the good management of the School, and for giving effect to the other purposes of this scheme; provided that no such by-law or regulation shall be inconsistent with the provisions of this scheme and that the same may be repealed, altered, or amended, from time to time, by the Governors, as they shall think fit.

Accounts and Audit.

18. The Governors shall cause to be kept regular accounts of all their receipts and disbursements, in such manner and form as may be, from time to time, prescribed or approved by the Local Government Board; and the accounts for each year ending the thirty-first day of December, or such other day as the Board shall approve, or an abstract thereof, in such form as the Board shall prescribe or approve, shall be submitted for audit on or before the first day of March following, or such other day as the Board may appoint, to an auditor of the Local Government Board, or to some other competent authority to be appointed or approved by the said Board. The Local Government Board may fix, and the Governors shall pay, such reasonable sum as shall be necessary to defray the cost of audit. The Governors shall keep an account with such bank as they may from time to time select; all moneys receivable or payable by them, except petty cash, shall be lodged to or drawn from such account; and every cheque shall be signed by two Governors, at the least, thereto authorized.

Inspection.

19. The Inspector to be appointed by the Lord Lieutenant in pursuance of the Act, Section 17, shall inspect the School once at the least in each year, and as much oftener as the Lord Lieutenant may direct, and shall present his reports thereon to the Lord Lieutenant; the remuneration of the Inspector, when fixed by the Lord Lieutenant, shall be defrayed by the Governors out of the endowments, as the Lord Lieutenant may direct. Provided that unless and until the Lord Lieutenant shall appoint an inspector, the Inspector appointed by the Senate of the Royal University of Ireland to inspect the School, shall be deemed to be the Inspector appointed by the Lord Lieutenant; but such Inspector shall not be entitled, as such, to any remuneration in addition to the remuneration which he may be entitled to receive from the Royal University.

Powers of the Governors.

20. Subject to the other provisions of this scheme, the Governors shall have and exercise general control over the School; they shall determine, after consultation with the Faculty, the various subjects of education to be taught therein, and shall make such rules and regulations as they may think fit, for the maintenance of order and discipline; they shall fix the date of the opening and closing of each session, and shall determine the conditions upon which students shall be entitled to receive free lectures, exhibitions, or prizes. Subject as aforesaid, they shall fix, from time to time, the number, salaries, and other emoluments of the several persons to be employed on the teaching and domestic staff, and shall determine their tenure of office and their respective duties.

Subject to the provisions hereinafter contained, as to the vested interests of individuals holding office at the date of the passing of the Act, the Governors shall appoint the Professors, Lecturers, and other teachers of the School, and also the Registrar and other officers and servants of the School; provided that so long as the said Registrar, officers and servants are paid wholly or in part by the Faculty from the fees of the students, every officer so paid shall be appointed by the Faculty. Subject to the said provisions as to vested interests, every member of the teaching staff or other person engaged in the service of the School may be suspended from office by the Governors, and may be removed by them for such cause as they shall deem adequate; provided that no Professor, Lecturer, or other teacher shall be dismissed, during his term of office, except upon a resolution passed at a special meeting of the Governors summoned on due notice, and that every person so dismissed shall have an appeal to the Board of Visitors hereinafter constituted. The Governors may from time to time determine, by general regulations, in what way, and under what conditions provision shall be made to supply the place of any Professor, or other member of the teaching staff, who may be prevented by illness, or by other temporary impediment, from fulfilling his duties in person.

The Faculty.

Members of the Faculty.

21. The Faculty shall, in the first instance, consist of such and so many of the following persons as, at the date of this scheme, shall hold office as Professors or Lecturers in the School:—

1. Christopher J. Nixon, LL.D., M.D., F.R.C.P.I.
2. Francis J. B. Quinlan, M.D., F.R.C.P.I.
3. Patrick J. Hayes, M.D., F.R.C.S.E.
4. Charles Coppinger, M.D., F.R.C.S.I., F.R.U.I.
5. John Campbell, M.D., F.R.U.I.
6. Ambrose Birmingham, M.B., B.CH.
7. Antony Roche, L.R.C.S.I., L.R.C.P.I.
8. Alfred John Smith, M.B., M.CH., M.A.O.

The above-mentioned persons shall continue to be members of the Faculty so long as they continue to hold office in the School; subject to this provision, all the Professors of the School shall be members of the Faculty so long as they retain the office of Professor; and the Governors may, from time to time, add to the Faculty persons holding the office of Lecturer in the School, in particular departments to be specified by the Governors, provided that the members so added shall not at any time be more than three.

The Dean of Faculty.

22. The Dean of Faculty, who shall be *ex-officio* Chairman of the Faculty, shall be annually elected by the Faculty from their own body, in the month of October. He shall enter upon office on the first day of November following his election, and shall retire on the thirty-first day of October in the following year. Each outgoing Dean of Faculty, if otherwise qualified, shall be eligible for re-election. The first Dean of Faculty shall be Christopher J. Nixon, LL.D., M.D., F.R.C.P.I., if at the date of this scheme he shall be a Professor of the School.

Meetings of the Faculty.

23. The Faculty shall meet at the School, once at the least in each month except during vacation, and they may also meet at such times and places as they shall themselves appoint. Minute books shall be kept by the Faculty in which all their proceedings shall be duly entered. The Dean of Faculty shall preside at all meetings of the Faculty at which he is present, and in his absence the members present shall elect one of their number to act as Chairman. Three members shall constitute a *quorum* of the Faculty, and all matters and questions shall be determined by a majority of the members present; in every case of equality of votes, the Chairman of the meeting shall have a second or casting vote.

Functions of the Faculty.

24. Subject to the other provisions of this scheme, and to the supreme control of the Governors, the Faculty shall have charge of all matters directly appertaining to education in the School; they shall make a report to the Governors, once at the least in each year, on the condition of the School and on the progress of the students; and they shall make such recommendations as their experience may suggest. They shall also make such special reports, from time to time, as they may think expedient, or as the Governors shall require. They shall have the care and safe keeping of the buildings of the School, and of its various collections, laboratories, museums, and appliances, and they shall report thereon to the Governors. Subject as aforesaid, the Faculty may make such arrangements as they shall deem expedient, regarding the fees to be paid by the students, and the manner in which these fees shall be applied; provided that two students at the least, to be nominated by the Governors, shall be admitted each year to free lectures. The Faculty shall make provision, in such manner as the Governors shall from time to time direct, to supply the place of any Professor, Lecturer, or other member of the teaching staff, who may be prevented by illness, or by other temporary impediment, from discharging his duties. In every such case the cause of the absence of the Professor, Lecturer, or other teacher, and the period for which his place has been supplied, shall be entered on the Minutes of the Faculty.

The Registrar.

25. The first Registrar of the School under this scheme shall be Ambrose Birmingham, M.B., B.CH. If and so long as the Registrar is paid wholly or in part by the Faculty from the fees of the students, he shall go out of office on the thirty-first day of October in each year; and, in the same month, the Faculty shall elect his successor from among the Professors and Lecturers of the School; and the person so elected shall enter upon office on the first day of November following his election. Each outgoing Registrar, if otherwise qualified, shall be eligible for re-election. If and whenever the Registrar is paid wholly by the Governors out of the endowments, he shall be elected by the Governors; and he shall hold office for such period, and under such conditions, as the Governors shall from time to time determine.

Duties of the Registrar.

26. It shall be the duty of the Registrar to receive the fees of the students, and all other moneys payable to the Governors or to the Faculty, to issue receipts for the same, and to keep such accounts of the fees and other moneys received by him as the Faculty, or the Governors, may from time to time direct. He shall keep, in a book to be provided for that purpose, and to be called the Attendance Book, a record of the lectures and attendances of the several Professors, Lecturers, and other teachers in the School; he shall have the custody of the Class Rolls upon which the attendances of the students shall be marked; and he shall submit the Attendance Book and the Class Rolls for the inspection of the Governors at each of their meetings. The Registrar shall act as Secretary to the Faculty, and shall discharge such other duties as may be, from time to time, assigned to him by the Governors or by the Faculty.

The Dean of Residence.

The Dean of Residence.

27. From and after the date of this scheme a Dean of Residence shall be appointed by the Bishops, and shall hold office for such period as the Bishops may from time to time determine. The first Dean of Residence shall be the Very Rev. Robert Carbery, S.J.

Functions of the Dean of Residence.

28. The functions of the Dean of Residence shall be:—

(*a.*) To take charge of a residence house for the students of the School, under such regulations as may be approved by the Bishops, if and whenever a residence house shall be established.

(*b.*) To approve of lodging houses at which the students of the School may reside, and to see that such houses are properly conducted.

(*c.*) To take charge generally of the moral and religious conduct of the students of the School, and to make such provision, subject to the approval of the Governors, as he may deem necessary or desirable, for their attendance to their religious duties.

The Board of Visitors.

The Board of Visitors.

29. From and after the date of this scheme a Board of Visitors shall be constituted for the School. It shall consist of four *ex-officio Visitors*, and three co-opted Visitors.

The *ex-officio* Visitors shall be the four Roman Catholic Archbishops of Ireland, for the time being; two of the co-opted Visitors shall be Benchers of the Honorable Society of the King's Inns, Dublin; and one co-opted Visitor shall be a person of distinction in the Medical profession.

The first co-opted Visitors shall be such and so many of the following persons as, at the date of this scheme, shall be qualified, able, and willing to act as Visitors:—

1. The Right Hon. Christopher Palles, LL.D., Lord Chief Baron of the Exchequer.
2. Richard Paul Carton, Esq., Q.C.
3. Sir John T. Banks, K.C.B., M.D.

Vacancies.

30. Whenever any co-opted Visitor shall die, or resign by writing under his hand, or refuse to act, or become incapable of acting, his office shall thereupon become vacant; and as soon as conveniently may be, after the occurrence of each vacancy, the remaining Visitors shall co-opt a qualified person to fill the vacant place. Such co-option may be carried out at a meeting of the Board of Visitors, or by voting papers without a meeting, as the Board shall from time to time determine.

Powers of Visitors.

31. The Visitors may hold visitations of the School at such times and in such manner as they shall deem expedient; they shall have power to investigate and determine all questions of abuse or complaint that may be brought before them by any Governor or by any member of the Faculty, and all questions, relating to the School, which may be referred to them by the Governors or by the Faculty, or which, in the opinion of the Visitors, call for adjudication by them. They shall also hear appeals against the action of the Governors, or of the Faculty, by any Professor, Lecturer, teacher, or student of the School, who may feel himself aggrieved. In the case of any grave offence being established against a Professor, Lecturer, teacher, student, or officer of the School, the Visitors shall have power, if they deem it necessary in the interests of the School, to remove the person so offending, or they may inflict such lesser penalty as they shall judge expedient. The Visitors may appoint any three or more of their body, of whom one at the least shall be a co-opted Visitor, to act on their behalf; and the Visitors so appointed shall have all the powers hereby conferred upon the Board of Visitors; provided that no Professor or Lecturer shall be removed from his office, except at a meeting of the Board of Visitors specially summoned for the purpose, and attended by at least four members. The judgment of the Visitors shall in all cases be final. A meeting of Visitors may be summoned, at any time, by the Archbishop of Dublin, or by any three other Visitors. Notice of every such meeting shall be sent to all the Visitors not less than fourteen clear days before the day appointed for the meeting, and shall state the business for which the meeting is summoned.

Investments.

Investments.

32. The Governors may, from time to time, sell any of the property, funds, and securities vested in them (other than lands, or buildings, or books), and may invest the moneys arising therefrom, or other the capital of the endowments, and may also invest and accumulate any surplus or residue of income not required in any year for the purposes of the School, in any of the public stocks, funds, or securities of the United Kingdom, or of India, or in the Stock of the Bank of England or of the Bank of Ireland, or upon freehold or leasehold securities in the United Kingdom, or in any securities sanctioned by law, or by the practice of the High Court of Justice, for the investment of trust funds. The Governors may, from time to time, vary such investments, and they may, from time to time, resort to the accumulations of income from any previous year, and may apply the same for the purposes of this scheme.

The Governors shall not expend any portion of the capital of the endowments, except upon a resolution assented to by a majority of the whole body of Governors; and they shall not expend any portion of the capital representing the endowment mentioned in the Second Schedule hereto, Part I., without the previous sanction of the Bishops.

Payment of Expenses.

Payment of Expenses.

33. The Governors shall, subject to the other provisions of this scheme, pay out of the endowments all charges which, under the provisions of the Act, shall be properly and necessarily payable by the Governors or out of the endowments, for the taxed costs and expenses of this Scheme, or for audit and inspection, or for other purposes.

Provisions for Vested Interests.

Vested Interests.

34. Every individual who at the date of the passing of the Act held, and at the date of this scheme shall continue to hold, any office, place, employment pension, compensation, allowance or emolument under or arising out of the Endowments, shall continue to hold and be entitled to receive the same from the Governors, upon the same terms and in the same manner, in every respect, as he held and was entitled to receive the same, at the date of the passing of the Act; and every such individual shall remain bound to perform the same and all like duties for the Governors, so long as his employment shall continue, as he would have been bound to perform for his existing employers if this scheme had not passed; and his employment may be determined by the Governors, at any time after the date of this scheme, by dismissal for the like cause, or on the same notice or payment in lieu of notice, by the Governors, for or on which such employment might have been determined by his existing employers, if this scheme had not passed.

Discharge of existing Trustees.

Discharge of Existing Trustees.

35. Immediately after the date of this scheme the existing trustees of the endowments shall deliver up to the Governors the buildings, furniture, and appliances of the School, to be held by them for the purposes of this Scheme. The said Trustees, and all or any other persons having custody thereof, shall at the same time deliver to the Governors all books, documents, and other chattels and effects belonging to or held by them as or for such trustees, who shall thereupon be discharged.

Printing of Scheme.

Printing of Scheme.

36. The Governors shall cause this scheme to be printed, or shall procure printed copies thereof, and shall keep the same for sale at a reasonable price.

Alteration of Scheme.

Alteration of Scheme.

37. This scheme may be altered from time to time by the Commissioners of Charitable Donations and Bequests for Ireland, in any matter whatsoever, upon the application of the Governors or of the Bishops. Every such application shall specify the nature of the alteration required, and except upon such application no alteration shall be made; and no alteration shall be made contrary to anything contained in the Act.

SCHEDULES referred to in the foregoing SCHEME.

FIRST SCHEDULE.

The Buildings and Premises of the School.

1. All that piece or parcel of ground on the north side of Saint Cecilia-street, in the parish of Saint Andrew, and city of Dublin, containing in breadth in the front to Saint Cecilia-street sixty-two feet and one-half, in breadth in the rear the like number of sixty-two feet and one half, and in depth from front to rear seventy-seven feet or thereabouts, bounded on the north by premises which, at the date of the indenture hereinafter mentioned, were in the possession of Christopher M'Auley, hatter, on the south by the said street, on the east by waste ground, on which part of the Theatre Royal formerly stood, at the said date belonging to the representatives of W. Harvey, and on the west by other waste ground formerly belonging to Nicholas Carter, bricklayer, and at the said date belonging to the representatives of the said W. Harvey.

These premises are held under indenture dated May 23, 1838, for a term of five hundred years from March 25, 1838, subject to the yearly rent of £31 10s., and are now vested in the Most Rev. Thomas W. Croke, D.D., Archbishop of Cashel, the survivor of the trustees appointed under an indenture dated December 13, 1875.

2. All fixtures, furniture, fittings, collections, museums, appliances, books, and other chattels and effects at the date of this scheme belonging to the School.

SECOND SCHEDULE.

Moneys, Funds, and Securities comprised in the Endowments.

Part I.—THE BLAYNEY ENDOWMENT.

A sum of five hundred pounds Stock of the Bank of Ireland, standing in the books of the Governor and Company of the said Bank, in the name of the Accountant-General of the High Court of Justice in Ireland, in the matter of the estate of Hugh Blayney, deceased: Between the Very Rev. Archdeacon Nicholas Walsh, the Very Rev. Archdeacon James M'Mahon, and Edward Fottrell, plaintiffs; and Patrick Blayney, Annabella M'Caul, and the Right Honourable Hugh Holmes, Her Majesty's Attorney-General for Ireland, defendants.

Part II.—THE LYNCH ENDOWMENT.

The sum of one thousand pounds, sterling, being part of a bequest of the late Patrick Lynch, M.D., to the Catholic University, and now in the hands of the Most Rev. Michael Logue, D.D., Lord Archbishop of Armagh, and the Most Rev. William J. Walsh, D.D., Lord Archbishop of Dublin, as executors of the will of the said Patrick Lynch, M.D.

We, the Judicial Commissioners constituted under the Educational Endowments (Ireland) Act, 1885, having duly considered the foregoing scheme, hereby submit the same for the approval of the Lord Lieutenant in Council under the said Act, duly signed by both of us under our hands, this Twenty-second day of December, 1891.

GERALD FITZGIBBON, } *Judicial*
WILLIAM O'BRIEN, } *Commissioners.*

Witness—

N. D. MURPHY,

Assistant Secretary.

Documents, VIII.

VIII.

Tables put in by N. J. Synnott, Esq., B.A., Barrister-at-Law.

(See the evidence of Mr. Synnott, q. 6809, p. 174.)

(1.)

TABLE showing number of AGRICULTURAL HOLDINGS in IRELAND, classified according to Rateable Valuation, with respective number of Families and Population.

[See Census of Ireland, 1891, General Report, Part II., p. 172.]

Agricultural Holdings.	No. of Holdings.	No. of Families.	Population.
Not exceeding £4 in value,	127,098	119,268	567,823
£4 to £10 in value,	144,592	143,526	726,594
£10 to £15 „	60,866	64,451	337,111
£15 to £20 „	37,008	41,821	221,896
£20 to £30 „	41,185	51,205	275,166
£30 to £40 „	21,942	30,810	166,761
£40 to £50 „	13,391	20,993	114,005
£50 to £100 „	25,573	49,516	269,241
£100 to £200 „	10,454	29,411	156,433
£200 to £300 „	2,566	10,621	54,379
Above £300 „	2,196	17,388	89,061
Total,	486,865	579,010	2,978,470*

N.B.—Total number of families in Ireland in 1891 = 932,113.

* Under the head of population are included all persons, such as labourers, servants, &c., residing on the holding; this will explain why population per holding increases with the size of the holding.

If the dividing line be taken—(1) at holdings not exceeding £30 valuation, (2) not exceeding £100 valuation, the results work out thus:—

Agricultural Holdings.	No. of Holdings.	No. of Families.	Population.
Not exceeding £30 valuation,	410,749	410,271	2,123,590
Not exceeding £100 valuation,	471,655	521,590	2,678,597

The total number of holdings, above £100 valuation, in Ireland, is 15,216.

It does not seem possible, from the Census returns of 1891 (the latest available), to classify the agricultural occupiers, as above, according to religious professions.

The number, however, under each *general* head of "farmer," "bailiff," &c., are given for each religious denomination at p. 116 (males), and p. 123 (females), of the Census report for 1891.

The income-tax returns, moreover, do not give a clue to the profits of individual farmers, the tax being assessed on "properties," which may, or may not, be synonymous with the holdings of individuals.

The general result only can be stated, *i.e*, that out of 821,130 separate properties assessed under "Schedule B" 750,317 were exempted by reason of incomes not exceeding £160 per annum; *i.e.*, there were 71,813 properties assessed from which profits derived were over £160 per annum. This would include, of course, all cases of the owner farming his own lands, as well as tenant-farmers.

(2.)

TABLE showing comparison between SCOTLAND and IRELAND as to number of Persons paying INCOME TAX under "Schedules D and E" with Amount of Assessment, &c.

"SCHEDULE D."

—	No. assessed. (Persons or Firms).	Amount of gross Assessment.
		£
Scotland,	66,921	45,390,788
Ireland,	22,542	12,202,611

The above figures *include* in each case profits of particular properties, such as mines, quarries, fishings, &c. If these be *excluded* the following are the figures:—

—	No. assessed.	Amount.
		£
Scotland,	47,270	21,747,000
Ireland,	19,741	5,866,017

"SCHEDULE E."

(Salaries of public officials and officers of corporate bodies.)

—	No.	Net assessment.
		£
Scotland,	24,446	3,176,596
Ireland,	12,199	1,913,703

The above figures include, in the case of "Schedule D," firms, municipal corporations, railways, &c., and do not in either case classify incomes. The following tables (3) show the number of persons in each country assessed at incomes over £200 per annum—(1) derived from profits (Schedule D), (2) Salaries (under Schedules D and E).

(3.)

TABLES showing the number of PERSONS in SCOTLAND and IRELAND assessed at INCOMES over £200 per annum.

"SCHEDULE D" (Profits only, excluding Salaries).

—	Total No. of Persons Assessed.	No. with Incomes exceeding £200 per Annum.
Ireland,	17,185	5,706
Scotland,	44,074	13,651

"SCHEDULES D AND E" (Salaries of every kind).

—	Total No. of Persons Assessed.	No. with Incomes exceeding £200 per Annum.
Ireland,	14,711	6,591
Scotland,	33,407	13,660

Combining the two classes of incomes, of persons with incomes exceeding £200 per annum derived from professional, trading, and industrial profits, and from employments of all kinds (Schedules D and E)—

Ireland has . . . 12,297 persons.
Scotland has . . 27,311 ,,

(See pp. 131--137, Report of Inland Revenue Commissioners, 1901.)

(4.)

TABLE showing comparison between SCOTLAND and IRELAND as to receipt of INCOME TAX from each of these Countries under separate Schedules.

Schedule.	Scot'and.	Ireland.
	£	£
(Lands and Houses, &c.), A, .	808,000	433.000
(Farming Profits, &c.), B, .	32,000	28,000
(Government Securities), C, .	—	26,000
(Trades, Professions, &c.), D, .	1,844,835	383,274
(Employments), E, . .	155,000	79 000
TOTAL. (Actual Net Receipts). .	2,839,835	949.274

[See 44th Report of Commissioners for Inland Revenue for year ending 31st March, 1901, p. 107.]

NOTE—As illustrating the above tables, Statutory exemptions and abatements are given:—

Incomes not exceeding £160 *exempt*.
Incomes exceeding £160 and not exceeding £400 *abatement* to extent of £160.
Incomes exceeding £400 and not exceeding £500 *abatement* to extent of £150.
Incomes exceeding £500 and not exceeding £600 *abatement* to extent of £120.
Incomes exceeding £600 and not exceeding £700 *abatement* to extent of £70.

But it is to be noted that relief is given to *individuals*, not firms or companies. 52 & 53 Vic., c. 63, s. 19.

(5.)

TABLE showing the number of PERSONS in each DECADE, respectively, engaged in the principal avocations in Ireland.

Compiled from Mulhall's Dictionary of Statistics, Edition of 1892, pp. 421--427, and 439.

—	1841.	1851.	1861.	1871.	1881.
Agriculture, . . .	1,844.000	1,460,000	1.173,000	1.046.000	936,000
Manufactures, . .	989,000	687,000	566,000	500.000	379,000
Commerce, . . .	111.000	152,000	163,000	171.000	160,000
Professions, . .	40,000	44,000	45,000	49,000	52,000
Domestics, . . .	342,000	233.000	365,000	389,000	426,000
Paupers, . . .	-	308,000	45,000	74.000	115,000
TOTAL POPULATION, .	8.197,000	6,574,000	5,793,000	5,412,000	5,174,000

The statistics for 1891 are based on different definitions of the various classes, and therefore cannot be usefully compared with the above. The figures, according to 1891 classification, are as follows. The 1881 figures are corrected to the 1891 Census basis:—

Occupations, &c., of Population in Ireland.	1891.	Per cent. of Population.	As corrected.	
			1881.	Per cent. of Population.
Agricultural, . . .	936,759	19·92	997,996	19·28
Industrial, . . .	656,410	13·95	691,959	13·36
Commercial, . . .	83,173	1·77	72,245	1·40
Professional, . . .	214,243	4·55	198,634	3·84
Domestics, . . .	255,144	5·42	287,069	5·54
Paupers, . . .	105,336	—	115.000	—
TOTAL POPULATION, .	4,704,750	—	5,174.836	—

For a more detailed examination of the proportion of persons in each part of the United Kingdom engaged in various occupations, see Appendix IX. to Second Report on The Financial Relations between Great Britain and Ireland, p. 207, &c.; also Appendix X. to Second Report on The Financial Relations between Great Britain and Ireland, containing extracts from paper read by Mr. Charles Booth, "On the occupations of the people in the United Kingdom," at the Statistical Society, May 18, 1886.

(6.)

TABLE showing COMPOSITION of PROFESSIONS (Males), according to Principal Denominations.

The following tables are abstracted from the Report of the Census of Ireland, 1891, Part II., pp. 114, 115.

—	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Total.
PUBLIC SERVANTS.				
Civil Service (Officers and Clerks), .	2,369	1,653	368	4,651
Prison Officers, . . .	241	172	27	446
Municipal, Parish Union Officers, .	1,285	358	207	1,921
Other Local or County Officials, .	985	1,296	167	2,533
Army Officer (Effective or Retired),	200	1,577	51	1,956
Navy Officer (Effective or Retired),	60	200	7	268
CLERICAL.				
Clergy, ...	3,502	1,734	—	8,598
Missionary, Scripture Reader, &c., .	—	135	59	
Monk, including Lay Brother, .	866	—	—	
Theological Student, . .	929	110	113	
LEGAL.				
Barrister, Solicitor, . .	848	951	170	2,030
Law Student, . . .	162	102	35	313
Law Clerk and others, . .	1,264	600	74	2,223
TEACHERS.				
Schoolmaster and Assistant, .	5,015	1,050	865	7,066
Teacher, Professor, Lecturer, .	499	322	107	979
MEDICAL PROFESSION.				
Physician, Surgeon, .	837	924	333	2,293
Dentist and Assistants, .	59	81	31	202
Medical Student, Assistants, .	649	575	300	1,646
LITERARY AND SCIENTIFIC PERSONS.				
Author, Editor, Journalist, .	206	83	35	364
Reporter, Shorthand Writer, .	139	6	19	233
Student, including persons aged 15 years and upwards returned as Scholar, . . .	34,061	5,632	2,954	43,222
Scientific Pursuits, . .	13	23	5	53
Literary Institutes and Service,	70	38	7	70
ENGINEERS AND SURVEYORS.				
Civil Engineer, Apprentice, .	221	503	73	859
Mining Engineer, . . .	6	10	2	21
Land, House, Ship Surveyor, .	253	134	33	438
ARTISTS.				
Painter, Artist, . . .	75	94	21	248
Engraver, Artist, . . .	43	31	21	109
Sculptor, ...	63	24	3	92
Architect, . . .	98	120	35	279
*Musicians, Music Master, .	834	290	33	1,184
Art-Students, . . .	13	13	17	47
Photographer, . . .	190	137	60	378
Actor, ...	* 26	38	7	124

* Of these 53 can read only and 323 neither read nor write.

The figures contained in the foregoing Tables go to show (amongst other things)—(1) the general poverty of the country; (2) the relatively large proportion of Protestants of various denominations in the official and professional classes, and support the contention that the necessary funds for equipping and endowing a College or University for Catholics, could never be obtained from, and if obtained, would be an unfair burden on private resources; that the State should be proportionately liberal in its grants; and (under the second head) that proper facilities for higher education would tend to secure for Catholics an adequate and proportionate representation amongst the official and professional classes.—N. J. SYNNOTT.

IX.

DOCUMENTS, IX.

Document put in by H. R. Reichel, Esq., M.A., Principal of the University College of North Wales.

REPORT of a COMMITTEE of the UNIVERSITY of WALES on THEOLOGICAL COLLEGES.

(See the evidence of Mr. H. R. Reichel, q. 7108.)

The Theological Board appointed in 1898 a Committee "(*a.*) to inquire into the provision for the teaching of Theology made by the leading Theological Colleges in the United Kingdom, including the Theological Faculties of the English, Irish, and Scotch Universities, and to form some standard of equipment and efficiency which may be applied to the Colleges in Wales; and (*b.*) to ascertain what is the actual state or prospective arrangements in those Colleges which desire recognition at the hands of the University."

The Report on part (*a.*) was presented to the Board on June 23, 1899, and was "ordered to be received, printed, and circulated." It is now for the greater convenience of the Board here reprinted as

PART I.

It seems as if, according to Charter, c. XIV. § 6, the Theological Board and the Theological Colleges have nothing to do with any scheme of study in Theology as a subject qualifying for a degree in the Faculty of Arts. The Court is to approve "a scheme of study," and the examination is to be under the Faculty of Arts. But so far as either the Theological Colleges or the Theological Board are concerned, they seem, if the Charter is an ultimate authority, to have no *locus standi* save in connection with degrees in Divinity. If, then, we exclude, as manifestly outside our powers, the consideration of Theology as an Arts subject and confine ourselves to what has been fixed and defined by the Charter, three main questions emerge—first, the province of the Theological Colleges; secondly, what ought to be their academic function and equipment; and, thirdly, what recognition they ought to receive from the University.

I. As to their province. It may be assumed that, according to the Charter their work is intended to be post-graduate. At any rate no provision is there made for their fulfilling any function in connection with undergraduate studies. Nor is Theology permitted to be taught in any of the constituent Colleges. This does not prevent preparatory studies, like those of the Classical and Hebrew tongues, being pursued in these Colleges during the undergraduate course; but it regards such studies as strictly Arts subjects qualifying for the B.A. degree, and as such under the control of the Faculty of Arts. And while we may feel that classical studies bear more directly on the field of Theology as a whole than even Semitic languages, yet, as regards both, we feel that they lie outside our province; and it does not become us to prescribe to another faculty what standard it ought to set up. But we may be allowed to express the opinion that it would be a most disastrous thing for Theology to be placed under a Faculty of Arts which has no power to teach it and no special capacity to examine in it. Further, while the Charter gives the Court power to "approve" a scheme of study, it gives no right to require attendance at any College. The inevitable result would be to depreciate Theology below all the other studies in the University, to make a collegiate education in it superfluous, and to turn it into a refuge for all those who had failed in those subjects which are specially professed by the constituent Colleges. And though in the Statutes, XXIII., 10, the Court proposes to recognise a period of study in a Theological College as qualifying for the B.A. examination in Theology, yet this is a provision the Court seems to have no legal power to make compulsory. And if it could, the only effect would be to attach a mark of inferiority to the Theological Colleges; while their function as preparing for degrees in Divinity clearly marks them out as seats of the higher learning, carrying forward the work begun in the constituent Colleges.

II. Academic function and equipment. If, then, we assume that the Theological Board has to do with post-graduate studies, it is evident that its concern with Theological Colleges can be only so far forth as they are places where such studies can be pursued. Now, the Charter has room for Theological Colleges both within and without Wales. If a man be a graduate of the University of Wales he may study in an approved College either in Wales or outside it; but if he be a graduate of any University in the United Kingdom other than that of Wales he must study in a Welsh Theological College. We must, therefore, apply the same standard to Colleges inside and outside Wales; we cannot ask more of those without than we ask of those within, or less of those within than we ask of those without. If this be so, then let us see what is the provision in those Theological Colleges outside Wales which may be described as endowed with an academic equipment.

In the Theological Faculties of the Scotch Universities, where the course qualifies for the B.D., there are four Professors, concerned, respectively, with the Old and New Testaments, Church History, and Systematic Divinity. In the New College, Edinburgh, which belongs to the Free Church of Scotland, there are seven Professors; in the Free Church College, Glasgow, there are five; and in the Free Church College, Aberdeen, four, with occasional lectures. There are five Professors and a Principal in the United Presbyterian College, Edinburgh.* In the case of all these Colleges a prior course in Arts is indispensable, and each may be said to teach up to the level of the B.D. degree. The Congregational Theological Hall, Edinburgh, has four Professors of Theology. In Trinity College, Dublin, there are six Professors, with fourteen assistants or tutors, and one Donnellan lecturer. The school is expressly intended for those who have already taken some course in Arts, and is open only to those who pass a satisfactory examination. While there is a catechetical course for undergraduates who are members of certain Churches, Theology is not recognised as a proper subject for the B.A. degree, whether with or without honours.

The Theological Faculties of Oxford and Cambridge are hardly typical for such Theological Colleges as are contemplated in the Charter and Statutes of the University of Wales, and need not be here specially discussed. In both cases the Faculty of Theology represents but a proportion of the Theological teaching done within the University. But it may be said that in each case there are seven Professors and a very large body of readers, lecturers, and tutors distributed through all the Colleges, and teaching, often in a very special way, in subjects doctrinal, philological, historical, ecclesiastical, and archæological. The undergraduate work in Theology, which is but a fraction of what is done in this field, cannot, of course, be regarded in isolation or taken as a measure of the Theological learning and activity of these Universities.

As regards the English Free Churches, strong efforts, extending over a considerable period of years, have been made to augment the staffs of almost all their Colleges. In Mansfield there are six Professors and tutors in Theology while Professors and lecturers in the University are also heard. In Manchester College there are four stated Professors, and several occasional

* Since this Report was written the Union of the Free and U. P. Churches has taken place, with the result that the College of the U. P. has been dissolved, and its professors used to increase the staffs of the three Colleges of the United Free Church.

lecturers. The Presbyterian College at Cambridge will probably be placed on a similar basis. In New College, London; the Baptist College, Regent's Park; and in the Yorkshire United College, four Professors are occupied with Theology; while in several others this number is either attained or exceeded by a method of interchange, in teachers or students, between Colleges.

III. On the basis of this statement of fact it seems as if we should be warranted in making certain stipulations as to the academic recognition of Colleges aspiring to teach for the B.D. degree.

1. It would appear to be but just, as the University has a distinct territorial and national note, that a distinction should be drawn between Colleges inside and outside Wales. Their academic obligations or qualifications ought to be the same, but their academic privileges to be different.

(*a.*) As to qualifications, it is obvious that no College can be approved and accepted by the Court under Statute XX. unless the Court be satisfied that the College possesses—

(i.) A curriculum which covers the whole field of study prescribed for the B.D. degree;

(ii.) Such an organisation of studies as shall secure an adequate amount of attention to each subject, and exact a sufficient number of terms from each candidate;

(iii.) An adequate staff of properly qualified Professors or tutors. From the facts specified above it seems as if the staff should be not less than four.

(*b.*) The special privileges to be accorded to Colleges in Wales should be directed to the purpose of bringing the Theological Colleges, as regards their own subject, into more organic relation with the University.

(i.) In the Faculty of Theology the recognised College ought to have some constituent place, *i.e.*, be entitled to representation in a given proportion on the Board of Theology;

(ii.) It ought to have a place in the University Calendar.

This Report has been drawn up in accordance with the resolution of the Board which was quoted at the outset, and also in harmony with another resolution of July 14, 1897, recommending the Court not to recognise Theological subjects in an Arts degree.

Finally, it may be said that it is to the interest of Theological Colleges, and to the interest of the Churches to make and to keep Divinity as a post-graduate study, for, as the result of extensive inquiries in England, Scotland, and Ireland, it is found that the number of Theological students has risen with the increase in efficiency of the Theological institutions; and, certainly, nothing has more tended to reduce both the number and the quality of students than the attempt, whether by Churches or Colleges, to cater for men by lowering the standard of what is required of them. As a matter of fact, the Churches that have most rigorously enforced a strictly post-graduate study of Divinity, have found the least difficulty in securing students; while those which have had most cause to lament the decline in the number and in the ability of candidates for the ministry are exactly those which have lowered their high claims, intellectual and moral, on the men who offer themselves for the high service of religion.

PART II.

The Committee appointed to deal with part (*b.*) of the above resolution, *i.e.*, to ascertain what is the actual state or prospective arrangements in those Colleges (*i.e.*, the Theological Colleges of Wales) which desire recognition at the hands of the University, consisted of the Vice-Chancellor (Principal Reichel), Dr. Fairbairn, Professor Gwatkin, and Professor Edwin Williams; but the work of inspection of the Welsh Theological Colleges, which this resolution enjoined, has been carried out by Principal Reichel and Dr. Fairbairn. The Colleges visited were—Brecon, May 29-30, 1900; Bala-Bangor Independent College and the North Wales Baptist College, Bangor, October 9-10, 1900; the Presbyterian or Calvinistic Methodist College at Bala, October 12; the English Presbyterian College at Carmarthen, April 17, 1901; the Calvinistic Methodist College at Trevecca, April 18; and the Baptist College at Cardiff, on April 19. They have not visited St. David's College, Lampeter; but they are not without the hope of being able to report concerning it before very long.

The visitors desire to express their sense of the courtesy with which they have everywhere been received, the fullness of the information given, the judicious character of the suggestions offered, and the readiness shown by all the Colleges and their officers to help forward the work of organisation and to bring themselves into line with the new developments in University Education. The visitors would also take this opportunity of stating how deeply they have been impressed with the work which, under great disadvantages and often apparently insuperable difficulties, these Colleges have accomplished. They gladly recognise the eminent services which they have rendered—through the education of the ministry—to the Churches of Wales, and to the thought and culture of the Welsh people; and they desire to record their belief that, by entering into federal relations with each other and with the University, these Colleges may achieve a distinction they have not yet known, and a usefulness they have never anticipated. It is in the hope that these high ends may be served that this Report is now presented.

The Report falls naturally into two parts: A, an account of the Colleges visited, and B. suggestions towards their organisation, in order to a better relation to the University, and towards a more regulated relation of the University to them.

A.

In this first part of the Report it will be more convenient to deal with the Colleges in groups, arranged according to their ecclesiastical connection and constitution than according to the order and time of inspection.

I. The Presbyterian or Calvinistic Methodist Colleges.

(*a.*) *Bala.* This College has a pathetic interest of its own, for its last Principal was T. C. Edwards, the only honorary graduate in Divinity of the Welsh University, and the first Chairman of its Theological Board. He was not only a great Welsh preacher and the foremost Welsh theologian of his generation, but he had proved himself also a distinguished academic statesman. It would be impertinent in us to praise the services he rendered to the higher education in Wales during his long Principalship of Aberystwyth; or to describe the formative influence he exercised, during his brief but potent Headship of Bala, upon the course of ministerial education and theological learning. The spirit that animated him seems still to survive in the College he last served, and to be impersonated in its teachers and students. The building is excellent, well suited for its purpose, with evidence of careful maintenance and assiduous use. The system is non-residential, though the students live in licensed houses. The College has an ample, well-selected, and well-housed library. The staff has not, since Principal Edwards' death, received its final form or equipment, but as it stands it consists of five Professors—two graduates of London, two of Edinburgh, and one of Oxford—with the clerical work under the care of a resident Registrar. The curriculum is definitely and distinctly Theological, so arranged as to cover all the subjects needed for the B.D. Ethics, Apologetics, Theism, and Comparative Religion, are assigned to the Vice-Principal (the Rev. Ellis Edwards, M.A.); Dogmatics and History of Doctrine to the Rev. E. O. Davies, B.Sc.; Hellenistic Greek and Greek Testament to the Rev. R. H. Richards, B.A.; Church History to Professor Hugh Williams, M.A.; Old Testament Exegesis, Hebrew, and Introduction to the Old Testament, to Professor W. B. Stevenson, M.A., B.D. There are no Arts or Science subjects taught in the College; and the men who enter must have obtained their literary education beforehand, either in a University College or in the Preparatory School at Bala, or in some other approved

or known institution. The normal length of the course is three years, though special provision is also made for men who desire to carry further their Theological studies. In the towns where the University Colleges are, Committees exist charged with the supervision of the Bala students attending them. The College has its own entrance examination, which the candidates for admission must pass. It is open to students irrespective of Church, and, though certain of their Scholarships are limited to members of their own denomination, the deed which founds their most valuable Scholarships expressly provides that "no candidate who is a Protestant shall be excluded on the score of nationality or religious denomination."

The number of students at present in the College is thirty-nine, of whom thirteen are graduates. Of these thirteen, eleven are reading for the B.D., seven for the first and four for the second. The College is thus thoroughly well organised, excellently administered, and, as the results of the B.D. examinations prove, efficiently taught. It is a College that would do credit to any academic system.

(*b.*) *Trevecca.*—This College stands, quiet and secluded, in a beautiful district; and though its means are small, its buildings limited, and not well suited to academic purposes, yet the whole has a fine fragrance of use, and seems pervaded by associations of a signally helpful and stimulating kind. The staff consists of four men—one (the Principal) an M.A. of Trinity College, Cambridge, the other three are all graduates of Oxford, and belong, respectively, to Jesus College, to Corpus Christi, and to Wadham.

The College has been placed on a new footing as a Theological College, and the various subjects qualifying for the B.D. degree have been thus assigned: Philosophy and Dogmatics to the Principal; New Testament Exegesis and Church History to Professor Edwin Williams, M.A.; New Testament Language and Patristic to Professor Young Evans, M.A.; and Old Testament Language and Literature to Professor Parry Williams, B.A.

The students do not reside in the College, but, as at Bala, in supervised lodgings. There are in all forty-seven students in residence, and these are entirely engaged in Theological studies. The men who need education in Arts are now sent to one or other of the University Colleges. The normal length of the course is two years in Arts and three in Theology, which latter period must be passed at Trevecca; but if degrees are to be taken, three years are allowed at a University College, and another three required in Trevecca. Of the forty-seven students, eight are graduates, and of these seven are reading with a view to the B.D. The College is more distinctly Presbyterian than Bala, as the men are admitted by a Committee of Synod, and, while under the immediate direction of the faculty of the College, are yet ultimately responsible to the authorities of their Church. The College year consists of three terms of eleven weeks each. The endowments are not large, but the amount of work accomplished is more than considerable.

There are here, as in the case of Bala, various questions pending as to the future of the College; but, if we may judge from the feeling of the Professors, and from all we could learn of the feeling of the Church, it is certain that any change will be in the direction of increased efficiency. The visitors may be allowed, however, to express the hope that if the College remains where it is, something may be done to give it a fitter and ampler home, without in any degree impairing those historical associations that constitute so much of its charm. The accommodation is at present so cramped that it cannot but interfere with the energy of the teaching. And they would also add, what is not applicable to Trevecca alone, but, in varying degrees, to all the Colleges they visited, that Professors and tutors were rendering ungrudging service upon incomes which hardly befit the dignity or do justice to the liberality of the communities in whose name and for whose honour they work.

II. THE INDEPENDENT OR CONGREGATIONAL COLLEGES.

(*a.*) *Brecon.*—This College was founded in 1755, and since then its history has been honourable as well as continuous. Its present buildings, which are comparatively new, having been erected in 1867, are admirably situated, and constructed for a residential system. The visitors regretted, indeed, to observe signs of carelessness, or even neglect in the maintenance of the building and its furniture, as if repairs were infrequent; while the students were subjected to domestic regulations which seemed hardly consistent with the dignity proper to their present status and their prospective careers. They could not but feel that a College whose purpose was the preparation of men for the sacred ministry ought most diligently to cultivate in them self-respect and concern for the amenities, if not the elegancies, of life. And they would like to express here an opinion, which is applicable to all the Colleges of the kind, and not simply to Brecon, that studious attention should be given to all that would qualify men to appreciate the refinements needed for the part they will have to play in life. The library of the College is old, and had been in recent times much neglected. But the visitors were glad to find evidence of the desire to bring it up to date, and make it worthier of the work the men have to do, and the studies for which the College stands. Its curriculum has been made wholly Theological, and has been, as far as possible, adapted to the studies required for the B.D. Its staff consists of three Professors; all are graduates of London, one being, in addition, a B.D. of St. Andrews, and another a B.A. of Oxford. Their subjects are divided as follows: Greek Testament and Literature, and Practical Theology fall to the Principal (the Rev. D. Rowlands, B.A.); Hebrew Bible and Literature, and Church History, to Professor T. Lewis, M.A., B.D.; Doctrinal Theology, Apologetics, Philosophical Theism, and the history of Religions, to Professor T. Rees, M.A., B.A. The students are required to take all their Arts course at a University College, and have to pass a qualifying entrance examination. The ordinary length of the course is four years, which is equally divided between a University College and Brecon. In the case of men being able to graduate in Arts they are allowed to take a third year at a University College, though without reducing their term in Theology. At present there are thirty-eight men on the books, twenty of these being at Cardiff, and one at Aberystwyth, while seventeen are studying Theology at Brecon. Two have taken their first B.D., and several candidates are preparing for the same examination.

The College is thus seriously setting itself to profit by the higher education of the University, both as regards Arts and Theology; and the spirit which animates its teaching is full of promise. Its position in Brecon is not unfavourable for the pursuit of its special studies, for it is comparatively near to Trevecca, and intercourse between the students and interchange of functions among the Professors may yet be found to be possible.

(*b.*) *Bala-Bangor.*—This College is a much more recent creation than Brecon. It was established by the union of two institutions, the elder of which (Bala College) was established in 1842, and amalgamated with Bangor in 1890. The reason for the migration to Bangor was the existence of the University College, which, it was hoped, might be used for the literary instruction of its students. It has not as yet built for itself a permanent home, though this is ultimately contemplated. Its library is certainly at present not equal to the needs of a living and organised College. There has indeed been much for it to contend against, especially as regards changes in the staff, the difficulty of readjustment to new conditions, and the securing of students who are fully equal to a sufficient academic standard. The College stands amid exceptional advantages, and may, if well advised and supplied with adequate means, be easily organised in a way that will enable it to use its fine opportunities. Indeed, in the work of efficient organisation a beginning has already been made. Thus it has so far united with the neighbouring Baptist College as to form what may yet be an important Theological staff, consisting of six Professors, three of whom are graduates of London, and one a graduate of Glasgow. The curriculum is organised thus: the Principal (the Rev. Lewis Probert, D.D.) lectures on Doctrinal and Pastoral Theology; Professor T. Rhys, B.A., on Apologetics and Theism; Professor J. M. Davies, M.A., on Hebrew and Ethics; while from the Bangor Baptist College, Principal Silas Morris, M.A., lectures on New Testament Exegesis and Church History; Professor T. Witton Davies, B.A., Ph.D.,

on Comparative Religion, and the History of the Eastern Religions; and Professor Owen Davies, D.D., on Homiletics. The normal length of the course is, as at Brecon, four years; but the terms on which the students are received differ considerably. They practically fall into two classes. (i.) A class able to profit by the higher teaching in Arts. In their case the standard of admission is the Matriculation examination of the Welsh University, with Greek as a necessary subject; and those who pass it are required to attend the University College. And if any student in this class should prove himself able to enter for the Arts and for the B.D., his course can be extended to six years. It is also understood that only after they have completed their Arts studies will their work in Theology begin. Of the twenty-four men now in College eight are said to stand in this category. (ii.) The second class is made up of men too little advanced to profit by attendance at the University College. They receive, so far as the visitors could ascertain, no proper Arts' training at all, and were reckoned as students of Theology from the outset. The inconvenience of this arrangement is obvious; it forces the Theological teaching down to the level of the least prepared men instead of keeping it up to the standard of the best equipped. This, indeed, is an inconvenience that all the Theological Colleges suffer from in varying degrees; but the point where the inconvenience seemed most acute was at the two Theological Colleges in Bangor. The visitors were struck with the little required from the men, whether at entering or at leaving; and with the comparatively slight sense the Colleges appeared to have of their own possibilities. For it seemed to them that, from their position and opportunities, they ought to have a much larger proportion than they at present have of B.A.'s, and of men going in for the B.D. degree. Their difficulty seems to be twofold; first, in getting the men sufficiently well-grounded to take the B.A. within a reasonable time, and, secondly, in keeping them, after taking the B.A. long enough under tuition to take the B.D. Up till now the Bala-Bangor College has sent no candidate in for the B.D., but three are reported to be reading with a view to it. The visitors hope that a little further consideration and more extended experience will enable the College to become a genuine seat of learning.

III. The Baptist Colleges.

(*b.*) *South Wales Baptist College, Cardiff.*—This is the oldest of the Colleges of this denomination in Wales. It was established as a Welsh and English Education Society, at Abergavenny, in 1807. It moved to Pontypool in 1836, and from there to Cardiff in 1893. It did this in order that it might profit by the University College, and have the whole education in Arts taken off the hands of the Theological tutors. The College occupies what is but a temporary building, where men do not live, but are taught. The library is fairly good, and seems to represent much activity of mind on the part of teachers and of students. The resident staff is but two, both its members being graduates of London, though Professor Tyssil Evans, M.A., of the University College, so lectures in connection with the College as to count as a third Professor, taking as his subject Hebrew Language and Literature.

The number of men in the College at present is twenty-four; of these, seventeen are reading for a degree, two are graduates, both of whom are studying with a view to the B.D., two having also taken the first part in previous years. The College has evidently taken its academic work seriously and faced its difficulties with forethought and courage. The fact that it surrendered good buildings in a fine situation, which it had occupied for nearly sixty years, in order that it might bring its men under the influence of the University College, Cardiff, and enable them to graduate in both Arts and Divinity, speaks much as to the spirit which has animated its teachers and governors. While its staff is small, it is yet able to show distinctions at both the Theological and University examinations. What it needs is fuller equipment, and so a more adequate curriculum on the one hand, and, on the other, a longer time from its men, so as to enable them to complete their degree in Divinity. The regular period for which a student is admitted is four years, though this may be shortened or lengthened according to circumstances.

It is matter for regret that so many Colleges feel the question of time to be a serious difficulty. The Scottish Churches have not found seven years as a minimum and eight years as an average too long a period of preparation for students for their ministry; and what the Scottish Churches have accomplished, the Welsh Churches, especially with the new advantages of intermediate and higher education, ought to be both able and willing to secure for the men they hope to be their religious teachers in the next generation.

(*b.*) *The North Wales Baptist College, Bangor.*—This College was founded at Llangollen in 1862, and moved to Bangor in 1892. Much that was said of the sister institution in Cardiff applies here. Its staff has been enumerated in connection with the Bangor Independent College. The curriculum is altogether Theological, the men going for their Arts course to the University College. The normal term for which a student is admitted is three years, though a fourth or a fifth year may be added to this, should the tutors so recommend. As a matter of fact the students seem in too backward a state to proceed to a degree either in Arts or in Divinity, though it is satisfactory to hear that of the sixteen presently in residence, six are reading for a degree, one of whom is expected to graduate in June, and then to proceed to the B.D. As already pointed out, the combined staff of which the College is able to avail itself is highly competent to teach for the degree in Divinity; and the College would do well to consider how best it can secure for the ministry men either better qualified from a literary point of view, or with more time to pursue their course to its natural academic completion. The College is so favourably situated, with so many advantages derivable from its association with the Independent College on the one hand, and the University on the other, that such a consummation would seem not only possible but natural.

IV. The Presbyterian College, Carmarthen.

This is the oldest of all the Welsh Theological Colleges, and notable for the eminent services it has rendered to the ministry of the various Churches in Wales. It runs back to an Academy founded by the Rev. Samuel Jones, M.A., Fellow of Jesus College, Oxford, a minister ejected in 1662. It is supported and governed by the Presbyterian Board, London, founded in 1689; though endowed in part from other sources, including the will of Dr. Daniel Williams. While thus maintained and governed by the denomination which has come to be known as Unitarian, it has never been confined to any single denomination, either as regards its Professors or its students. It has at this moment three Professors, including the Principal—two being graduates of Oxford and one of Glasgow, the latter being a Congregationalist. Between them they teach Philosophical Theism, Ethics, Comparative Religion, the Old and New Testaments, Patristic and Church History. The course is thus almost exclusively Theological, though English Literature and Economics have a place in the curriculum. The students are all preparing for the ministry; they number at this moment thirty-two—twenty-four being Congregationalists, seven Baptists, and one Unitarian. They have no graduates, nor do they see any likelihood of graduates so attending as to make candidates for the B.D. other than a negligible quantity. The position of the College at Carmarthen, the limited nature of its constituency, and the strictly measured and limited source of its income, will prevent either the use of the University College, or its own better adaptation to degree work. There is no College in Wales that has so long a history, or a more honourable record; and it would be much to be regretted that it should be outstripped in the race, or left out of any scheme that aims at academic comprehension. But the College does not seem at this moment able to do the work required of Colleges whose candidates for Theological degrees must be graduates in Arts. It is no part of the function of the visitors to advise a body that has acted with so much judgment and generosity as the Presbyterian Fund Board, nor is it congenial to them to suggest the uprooting of an institution from a place where it has lived for over 200 years; yet they cannot but express the fear that, if it remains where it is, it may be forced to be contented with students any record of University achievement.

DOCUMENTS, IX.

B.

The second part of the Report may be divided into three sections:

I. The conditions of approval and recognition.

II. Definition and distinction of Colleges as regards these conditions.

III. The privileges which approval and recognition ought to confer.

I. The Committee feel that it would be somewhat inconvenient to draw up at this stage a list of those Colleges that ought to be excluded and those that may be included. They will not, indeed, when the occasion has arisen, hesitate to propose such a list; but at present they prefer to specify the conditions of approval and recognition, and thus to allow to the institutions concerned opportunity for reflection and equipment.

In stating these conditions they are guided by what seem to them principles both of justice and of academic policy. Justice requires them to consider the honour and dignity of the University, the good of the Theological Colleges, the claims of the special studies for which they exist, and the efforts and the achievements of those Colleges which have undergone the labours and made the sacrifices needed to satisfy the demands made by the studies required for the Theological Degrees. Academic policy makes it necessary to consider the future as well as the present, the changes which the new education—elementary, intermediate, and higher—is introducing into the mind and outlook of Wales; and, therefore, the kind of men and the quality of the learning on which the University is to be asked to set its seal. The Charter and the Statutes have combined to fix one point; the Committee must concern itself with Colleges rather than with teachers. But it is obvious that their estimate of the Colleges will depend upon their estimate of the teachers; and thus it will be necessary to consider the teachers that constitute the College, as well as the studies and the students for which the College exists. A Theological College is defined in the Statutes of the University as "an institution approved and accepted by the Court where instruction is provided for candidates for Theological degrees in all the subjects required by the University for such degrees." Standing Order VIII. gives a list of Colleges which may be accepted and approved, but in the preamble to the list it is expressly stated that these Colleges are to be accepted and approved only provided "they shall give instruction in all the subjects required for the Theological degrees of the University"; instruction, it is implied, in such a form and of such a quality as the University shall consider academically adequate. The conditions which follow alike from the Statute and the Standing Order seem to be these—

(*a.*) In order to adequate instruction there must be an adequate staff, and adequate must here be understood to apply both to the number and the capability of the teachers. In the former Report the number suggested was four. The Committee see no reason to change this number, especially as Colleges already exist which have complied with the condition, and so set a standard the University must be the first scrupulously to regard. It is also only fair that the University regard the academic status of the teachers, if not as a sign of competence, at least as the witness to a given capacity. To insist upon four teachers as a minimum involves no departure from the principle expressed in the Statutes, that the teaching staff may exist either singly, *i.e.*, as the staff of a single College, or "in combination with one or more similar and similarly approved institutions."

(*b.*) The instruction to be adequate must also be in all the subjects required for the degree—less cannot be required. This does not indeed fix an upward limit, for such a limit cannot in the nature of things be set. But it does fix a downward limit. It would indeed be absurd to recognise a College which did not make provision for the subjects which are defined as necessary to the degree.

(*c.*) The instruction must be given to qualified candidates, that is graduates either of the University of Wales or of some other known and recognised University. This means that a College which, for any reason, is unable to secure and retain such candidates is *ipso facto* excluded. The candidates are indeed as necessary as the staff, while their qualities can be more easily defined and ought to be as rigorously enforced. In order to the teaching of Theology there must be competent learners as well as qualified teachers, and if Colleges are to be approved by the University, then only those which possess the men the University has approved are able to give the necessary instruction.

The College that fails to fulfil all or any of these conditions should forfeit its claim to recognition. This means that the list must be open for revision from time to time, that it must be as possible to remove as to inscribe the name of a College, and that both must be done as occasion may demand.

II. As the organisation must be gradual and as provision has to be made both for the addition and the removal of Colleges from the academic or theological body, it seems necessary to indicate how these conditions may be applied to the existing situation.

(*a.*) The Committee propose that Colleges should be divided into two classes, the approved, and the approved and recognised. Approved Colleges will have the right to send in candidates for the B.D. examinations; but only approved and recognised Colleges will have the corporate rights and privileges belonging to the academic system here proposed.

(*b.*) The approved class will comprehend those Colleges which are so equipped and organised as to be capable of giving sufficient instruction in all the subjects required for the degree; but the approved and recognised class will comprehend those Colleges which are not only capable of preparing but have actually prepared a sufficient number of men for a sufficient period.

(*c.*) Approved Colleges shall be qualified to become recognised Colleges when they have for three successive years sent up qualified candidates; approved and recognised Colleges that fail for three successive years to send up candidates shall lose their right to recognition.

(*d.*) Theological Colleges outside Wales may belong to the approved class, but only Colleges in Wales can belong to the class of the approved and recognised.

III. The privileges. In the earlier Report the privileges specified were two:

"(i.) In the Faculty of Theology the recognised College ought to have some constituent place, *i.e.*, be entitled to representation in a given proportion on the Board of Theology.

"(ii.) It ought to have a place in the University Calendar."

The Committee desire now as the result of their investigations and of fuller consideration of the whole subject to recommend the development and more accurate definition of the privileges thus proposed to be conferred.

1. As to the constituent place to be assigned to the recognised Colleges.

(*a.*) Approved and recognised Colleges, and no others, shall be represented on the Theological Board.

(*b.*) Professors and tutors of all the approved and recognised Colleges shall be authorised to form themselves into a Senate or academic body with specific rights and defined duties. These shall include the right (i.) to representation on the University Court, (ii.) to appoint a Dean of Divinity, (iii.) to make suggestions or recommendations concerning studies and examinations to the Theological Board.

(*c.*) The duties of the Dean of Faculty shall be to represent the Faculty on academic occasions or in public functions; to receive on its behalf all correspondence and to answer any inquiries addressed to it; and to act as the medium of communication between the Theological Senate and the University. The Committee does not recommend that the appointment should be permanent.

2. As to their place in the University Calendar.

(*a.*) That the name of the Colleges shall appear as recognised and approved.

(*b.*) That the names of the Professors or tutors should also appear as constituting the Theological Senate.

(*c.*) That the students who are reading for the B.D. should appear as students of the University, though under the head of their respective Colleges.

The Committee believe that privileges of this order, guarded by conditions such as they have indicated, would result in the organisation of a Faculty of Theology that would, alike as regards the number of teachers and the quality of the students, and the range of studies, occupy a foremost place among the Universities of Great Britain.

A. M. FAIRBAIRN.

H. M. GWATKIN.

H. R. REICHEL.

P.S.—The following Table may be a convenient conspectus of the state of the Colleges. It is not possible in every case to make an exact division between Arts and Divinity students.

		STUDENTS.			CANDIDATES.		PASSED.	
—	Staff.	Arts.	Theology.	Graduates in Arts.	First B.D.	Second B.D.	First B.D.	Second B.D.
Bala, . .	5	None in College.	39	13	7	4	8	2
Trevecca, . .	4	None in College.	47	8	6	1	2	–
Brecon, . .	3	None in College, 20 at Cardiff, 1 at Aberystwyth.	17	5	3	1	2	–
Bala-Bangor, .	3	21*	24*	–	3	–	–	–
Cardiff, . .	3	24*	24*	2	2	–	2	–
Bangor (Baptist), .	3	16*	16*	–	–	–	–	–
Carmarthen, .	3	—	32	–	–	–	–	–

* This is the total of students, Arts and Theological.

* Professor Edwin Williams, as belonging to the Staff of a visited College, preferred not to sign the Report or take part in the deliberations of the Committee. He was present only at the first meeting.

X.

Documents put in by G. Johnstone Stoney, Esq., M.A., D.Sc., F.R.S., formerly Professor and afterwards Secretary of the Queen's University in Ireland.

(1.)

SUMMARY of steps taken by the COMMITTEE of CONVOCATION of the QUEEN'S UNIVERSITY in IRELAND, to induce the Government to reconsider the position of the University.

(See the evidence of Dr. JOHNSTONE STONEY, q. 6987).

DOCUMENTS, X.

Convocation, at a meeting held on the 7th October, 1880, passed the following resolutions unanimously:—

1. "That the Dissolution of the Queen's University, as contemplated by the University Education (Ireland) Act of 1879, would be a grievous infraction of the vested rights of the Graduates of this University, would be injurious to the interests of academical education, and would be in violation of expectations which a series of statesmen and of Parliaments held out to students in Ireland.

"2. That an earnest appeal ought to be made to the present Parliament and to the Government to reconsider the position of this University; and that it be an instruction to the Committee of Convocation to take steps by deputation or otherwise to give effect to this resolution; and that it be a further instruction to the Committee to seek the co-operation of the Graduates' Associations at the Queen's Colleges, and in London, in arranging who shall constitute any deputation sent forward."

The Committee of Convocation, in discharge of the duty entrusted to them, held meetings on the 27th October, 1st November, 19th November, 29th November, 1880, 27th January, 2nd February, 5th February, 18th February, and 2nd March, 1881, besides which there have been several meetings of Sub-Committees appointed whenever the progress of the proceedings required.

The Committee decided to ask the Prime Minister to receive a deputation from the University, and addressed to him a letter, No. 1 of the appended correspondence (App. I.), accompanied by a carefully prepared statement, which will be found in Appendix No. II., to which the Committee invites the attention of members of Convocation. Other letters followed, and Mr. Gladstone desired, in letter No. 4, that the Committee should make known their views to the Irish Government in the first instance. Accordingly they applied to His Excellency the Lord Lieutenant and the Chief Secretary for Ireland, who received a deputation from the University on the 9th December, 1880. An account of this interview is given in Appendix III.

Independently of the Committee the Senate of the University drew up, for the information of the Government, a memorandum on the history of the University. As the Committee think that the members of Convocation should have before them all the materials on which the Government acted, they annex this memorandum in Appendix IV.

Notwithstanding all these efforts, and the strength of the case which the University put forward, the Prime Minister, while expressing his great regret for the extinction of the Queen's University, has, in his letters, Nos. 7 and 9 of Appendix I., declined to interfere.

The Committee cannot resist a feeling of deep disappointment that Mr. Gladstone, while seeing cause to regret very much the provisions of the Act of 1879, which destroy the Queen's University, does not, as head of the Government of Her Majesty, regard it as possible for him to ask Parliament to prevent the wrong appointed to be done under those provisions, and the dangerous precedent in regard to other Universities thereby created. The University has the more cause to regret this determination, since without the active intervention of Her Majesty's Government it would be hopeless for the University to apply for redress to Parliament.

Although Mr. Gladstone now feels himself compelled not to take steps to maintain the Queen's University, the Committee cannot resist the conviction that the Act of 1879 will not be accepted as a final settlement, and that further legislation in regard to the Universities of Ireland is inevitable. They trust that any such legislation will be based on the academical and unsectarian principles which the Queen's University has for thirty years maintained.

By order of the Committee,

J. WILSON,

Clerk of Convocation.

Queen's University,
2nd March, 1881.

APPENDIX I.

CORRESPONDENCE between the Committee of Convocation of the Queen's University in Ireland and the Prime Minister.

1.—*The Committee of Convocation to Mr. Gladstone.*

Queen's University,
Dublin Castle,
10th November, 1880.

SIR,—I am directed by the Annual Committee of the Convocation of the Queen's University in Ireland to request that you will receive a deputation from the members of the University, in order that they may have an opportunity of stating their views upon the subject of the proposed dissolution of the University, as provided by the University Education (Ireland) Act, 1879.

The Convocation of the University at its last meeting unanimously passed two resolutions, of which a copy is enclosed.

The Committee direct me to forward to you a statement of the grounds upon which they venture to ask for an interview, which they trust you will grant.

The deputation will wait upon you at any time and place you may appoint.

I have the honour to be, Sir,
Your very obedient Servant,

JAMES WILSON, M.A., LL.B.,
Clerk of Convocation.

The Right Honorable
W. E. Gladstone, M.P.,
First Lord of the Treasury.

Enclosure No. I.

At a meeting of Convocation, held on Thursday, the 7th October, 1880, in St. Patrick's Hall, Dublin Castle, the following resolutions were unanimously passed:—

1. "That the dissolution of the Queen's University, as contemplated by the University Education (Ireland) Act of 1879, would be a grievous infraction of the vested rights of the graduates of this University, would be injurious to the interests of academical education, and would be in violation of expectations which a series of statesmen and of Parliaments held out to students in Ireland."

2. "That an earnest appeal ought to be made to the present Parliament and to the Government to reconsider the position of this University; and that it be an instruction to the Committee of Convocation to take

steps by deputation or otherwise to give effect to this resolution; and that it be a further instruction to the Committee to seek the co-operation of the Graduates' Associations at the Queen's Colleges, and in London, in arranging who shall constitute any deputation sent forward."

JAMES WILSON, M.A., LL.B.,
Clerk of Convocation.

Enclosure No. II. was the accompanying "Statement." (App. II.).

2.—*Mr. Gladstone to the Committee of Convocation.*

10, Downing-street,
Whitehall,
15th November, 1880.

SIR,—Mr. Gladstone has received your letter of the 10th inst., written by direction of the Annual Committee of the Convocation of the Queen's University in Ireland on the subject of the proposed dissolution of the University; and in reply I am to observe that Mr. Gladstone was not a party to the proposal, and that the mode in which he desired to proceed with the Irish University question is on record in the Irish University Bill of 1873. He does not, however, think that any advantage could arise from his receiving a deputation which seeks to deprecate the execution of an Act of Parliament passed without serious opposition at a recent date.

I am, Sir,
Your obedient Servant,
E. W. HAMILTON.

James Wilson, Esq., M.A.,
&c., &c.

3.—*The Committee of Convocation to Mr. Gladstone.*

Queen's University,
Dublin Castle,
22nd November, 1880.

SIR,—I have laid before the Committee of Convocation of the Queen's University in Ireland your letter of the 15th inst., in which Mr. Gladstone, replying to the request of Convocation that he would receive a deputation from the University, says that "he does not think that any advantage could arise from his receiving a deputation which seeks to deprecate the execution of an Act of Parliament passed without serious opposition at a recent date."

The Committee of Convocation have directed me to observe, that whatever the views of individual members may have been, Convocation, as the body authorised to express the opinion of the Queen's University, has not deprecated the carrying out of the policy adopted by the Legislature in the Act of last year, which provides for the establishment in Ireland of a University of the same type as the London University. What Convocation deprecates is the execution of the clauses added to that Act, which provide for the dissolution of the Queen's University, an addition which, they are prepared to show, is in no way necessary to the main object of the Act, was introduced by the late Government without inquiry, and under misapprehensions entertained by them, and conveyed to Parliament, which would do grievous wrong to many members of the University, and extirpate a type of higher education from the United Kingdom which has proved to be one of the best.

I am further directed to point out, that if, as Mr. Gladstone observes, the Act of last year passed without serious opposition, this was only because the inclusion of the Queen's University in that Act was a surprise, carried in the middle of the University vacation, and under the unprecedented circumstances that no intimation of it, or communication in reference to it, was made to the Chancellor, Senate, or Convocation of the University, or to any of its officers, notwithstanding the fact (which made such a communication the more obligatory), that the University was not represented in Parliament.

On the foregoing grounds I am directed by the Committee of Convocation to renew the request of Convocation, that Mr. Gladstone will receive a deputation from the University, and to ask you to solicit him to reconsider his determination in reference to it.

The almost immediate repeal of the destructive part of a recent Statute is not without precedent, as will be seen by reference to the legislation in 1873-74-75-76, on the subject of the appellate jurisdiction of the House of Lords.

I have the honour to be, Sir,
Your obedient Servant,
JAMES WILSON,
Clerk of Convocation,
Queen's University.

E. W. Hamilton, Esq.

4.—*Mr. Gladstone to the Committee of Convocation.*

10, Downing-street,
Whitehall,
24th November, 1880.

SIR,—I have brought to the notice of Mr. Gladstone your letter of yesterday, in which you ask that he will reconsider his determination about receiving a deputation from the Convocation of the Queen's University in Ireland; and I have received his instructions to inform you that he will be obliged if the members of the Committee of Convocation will, in the first instance, make known to the Irish Government their views on the subject of the recent "University Education (Ireland) Act." After this has been done, Mr. Gladstone will be prepared for further communication with the Committee.

I am, Sir,
Your obedient Servant,
E. W. HAMILTON.

James Wilson, Esq.,
&c., &c.

In accordance with Mr. Gladstone's suggestion in the foregoing letter, His Excellency the Lord Lieutenant and the Chief Secretary received a deputation from the University on the 9th of December, 1880.

5.—*The Committee of Convocation to Mr. Gladstone.*

Queen's University,
Dublin Castle,
2nd December, 1880.

SIR,—I am directed by the Committee of Convocation of the Queen's University to acknowledge the receipt of your letter of the 24th November, 1880, and to request you to convey to Mr. Gladstone the thanks of the Committee for yielding to their wish and allowing the position of the Queen's University to be further considered.

In compliance with Mr. Gladstone's desire the Committee are taking measures to place before the Irish Government their views of the recent "University Education (Ireland) Act, 1879," and have solicited an interview with His Excellency the Lord Lieutenant and the Chief Secretary for Ireland.

I am, Sir,
Your obedient Servant,
JAMES WILSON,
Clerk of Convocation.

E. W. Hamilton, Esq.

6.—*The Committee of Convocation to Mr. Gladstone.*

Queen's University,
Dublin Castle,
4th January, 1881.

SIR,—Permit me to remind you of your letter of the 24th November, 1880, in which you stated, that you "had received Mr. Gladstone's instructions to inform me that he would be obliged if the members of the Committee of Convocation would, in the first instance, make known their views to the Irish Government on the subject of the recent 'University Education (Ire-

land) Act,' and that after this had been done, Mr. Gladstone would be prepared for further communication with the Committee."

I beg to inform you that, in compliance with Mr. Gladstone's wish, I, by the direction of the Committee, applied to His Excellency the Lord Lieutenant and the Right Hon. the Chief Secretary for Ireland, that they would receive a deputation from the University on the subject. On the 9th December, 1880, His Excellency and the Chief Secretary were good enough to receive a deputation of members of the University, who fully explained the views of the Convocation and its Committee. His Excellency was pleased to say that he would place before Mr. Gladstone what the deputation had stated. The deputation represented the several Faculties of Arts, Law, and Medicine in the University; and also in a fair proportion the graduates of the different religious denominations in Ireland.

As the time is fast elapsing within which the Clauses of the "University Education (Ireland) Act, 1879," which affect the Queen's University, must be put in force, I trust Mr. Gladstone will excuse me if, on behalf of the Committee of Convocation I recall this matter to his attention. The Committee anxiously await his further communication.

I take the liberty of enclosing the draft of a Bill which, if adopted by Parliament, will accomplish all that the Committee of Convocation has asked. For facility of reference I enclose a printed copy of the correspondence (including your last letter), and the documents already submitted to Mr. Gladstone.

I am, Sir,
Your obedient Servant,
JAMES WILSON,
Clerk of Convocation,
Queen's University in Ireland.

E. W. Hamilton, Esq.

7.—*Mr. Gladstone to the Committee of Convocation.*

10, Downing-street,
Whitehall,
21*st January*, 1881.

SIR,—I have the honour to acknowledge the receipt of your further letter of the 4th inst., on the subject of the University Education (Ireland) Act, 1879, which I have laid before Mr. Gladstone; and I have to acquaint you that he has given his best consideration to that communication and the papers which accompanied it.

In reply I am directed to inform you that Mr. Gladstone very much regrets now, as he did when the Act was passed, the extinction of the Queen's University; but he does not think it possible to obtain from Parliament, or even to ask Parliament to give, its sanction to the combined existence of the Queen's and the Royal Universities; and I am to add that Mr. Gladstone's views in this respect accord with those held by His Excellency the Lord Lieutenant.

I am, Sir,
Your obedient Servant,
E. W. HAMILTON.

G. Johnstone Stoney, Esq.,
Queen's University, Dublin.

8.—*The Committee of Convocation to Mr. Gladstone.*

Queen's University,
5*th February*, 1881.

SIR,—I have laid your letter of the 21st ultimo before the Annual Committee of the Convocation of the Queen's University, and am directed to request you to convey to Mr. Gladstone the thanks of the Committee for having at a time of extreme political pressure complied with their request to reconsider the position of the University, and I am further desired to express through you the satisfaction with which the Committee learn that Mr. Gladstone has heretofore regretted, and still "regrets very much the extinction of the Queen's University."

The Committee recognise the grave political complications which render good legislation for the Universities of Ireland difficult, and which occasion special difficulty in the case of the Queen's University; but they still hope that Mr. Gladstone, as head of the Government of Her Majesty, may yet find it possible to ask Parliament to prevent the wrong appointed to be done under those provisions of the Act of 1879 which affect the Queen's University, and the dangerous precedent in regard to other Universities thereby created. The Committee feel that without the active intervention of Her Majesty's Government, it would be hopeless for the University to apply for redress to Parliament.

Convocation has consistently urged the maintenance of the principle of academic education as carried out in the Queen's University, and has submitted that the dissolution of the Queen's University would be a grievous and unprecedented infraction of the vested rights of University graduates, and a violation of expectations held out to students in Ireland for the past thirty years.

As the subject of University Education in Ireland must very shortly be considered by Her Majesty's Government and by Parliament, the Committee would invite attention to the reaction which is setting in against the system of mere examinations, and is being manifested by the offers of large sums of money in Manchester, Liverpool, Wales, and Dundee, for the endowment of teaching Professorships in Colleges. To this reaction great encouragement has been given by the grant of a University Charter to Owen's College and the Yorkshire College of Science.

Even in the University of London there has been a growing desire for many years to establish closer relations between the persons who teach its candidates and the Boards who examine them, and to found Professorial Chairs within the University itself. In proof of this, the Committee desire to draw Mr. Gladstone's attention to the enclosed Report of the Annual Committee of the Convocation of the University of London.

In the presence of such efforts to extend collegiate training and the influence of academic associations in England, Scotland, and Wales, the Committee earnestly request Mr. Gladstone to interpose before any irrevocable steps in an opposite direction are taken in Ireland, and, before it is too late, to receive a deputation from the Queen's University, whose duty it would be to bring before him the reasons why, at the very time when the University of London is struggling for the adoption of the essential principles of the Queen's University, the Queen's University desires that those principles should not be abandoned in Ireland.

I am, Sir,
Your obedient Servant,
JAMES WILSON,
Clerk of Convocation.

E. W. Hamilton, Esq.

9.—*Mr. Gladstone to the Committee of Convocation.*

10, Downing-street,
Whitehall,
10*th February*, 1881.

SIR,—I have the honour to acknowledge the receipt of the further letter you addressed to me on the 5th instant, in which you express a hope, on behalf of the Committee of Convocation of the Queen's University, that Her Majesty's Government may still be able to see their way to interfere on behalf of the constitution of the University.

Having submitted that letter to Mr. Gladstone, I am directed by him to say that he much regrets that he is not able to make any addition to his former announcement on the subject.

He is sure that, in the present state of public business, the Committee of Convocation will excuse his not entering into details.

I am, Sir,
Your obedient Servant,
E. W. HAMILTON.

James Wilson, Esq.

APPENDIX II.

STATEMENT with reference to Clauses 11, 12, 13, and 14, and the Proviso in Clause 4, of the University Education (Ireland) Act of 1879, prepared by direction of the Convocation of the Queen's University.

In the last days of the Session of 1879, an Irish University Education Bill passed through all its stages in both Houses of Parliament, and became law.

This measure, vitally affecting the Queen's University, was hurried forward with such haste that, incredible as it may seem, no communication was made by the Government to the Queen's University, nor was any opportunity afforded to it of forming or expressing any opinion on the subject.

The Act consists of two distinct parts: a constructive part creating an Examining Board in Ireland, with power to confer degrees; and a destructive part which declares that the Queen's University shall be dissolved.

For the second of these, not only does there not exist any precedent, but, if it be maintained, it becomes itself an alarming precedent for the other Universities of the United Kingdom, having regard to the circumstances under which it was carried.

It was not denied that the Queen's University had loyally, and with signal success, discharged all duties entrusted to it: the University was even commended on this ground; but in the hurry of the late Government the essential character of the Queen's University was misconceived—the Government had no time to inquire—they put forward a history of the University according with its supposed character, but quite at variance with its real history, at variance with its history in respect of every particular which bore on the legislation which they proposed—and they rested on these errors their recommendation to Parliament to dissolve the University. The Queen's University exerted itself to its utmost to get these disastrous mistakes corrected; but there was not time, the Session was on the point of closing, the Bill was urged through its last stages, and became law.

Lord Cairns, in making the official statement of the Government, on the 30th June, 1879, said (Hansard, Third Series, Vol. 247, col. 937 and 941)—

> "Now, what is the case with regard to the Queen's University? My lords, the history of the Queen's University is this:—In the year 1845, there were founded three Queen's Colleges in Ireland—one at Belfast, one at Cork, and one at Galway. They were founded, in the first instance, as Colleges, without any arrangements for conferring degrees. They were provided by Parliament with grants for building, and with considerable endowments for the foundation of Scholarships and Exhibitions. In a few years afterwards—I think in 1850—the Queen's University was incorporated for the purpose of conferring degrees upon those who were students of those three Colleges. Now, your lordships will understand that the Queen's University itself has, what I may term, no local or real existence beyond that of its corporate character. What I mean to say is, it does not undertake to teach; it has no Professors, it has no Fellows. It is not provided with any Scholarships or Exhibitions—it is simply an Examining Body. But, then, your Lordships will observe the peculiarity of this Examining Body is this—it does not examine for the purpose of conferring degrees at large, but for the purpose of conferring a degree only on those who pass through a curriculum or course of study in one of the three Queen's Colleges."
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> . . . . . .
>
> "The question then arises, what do we propose with reference to the Queen's University? Your lordships will remember that the Queen's University itself is but an Examining Body; but it is an Examining Body simply for the purpose of examining those students who are members of the three Queen's Colleges. It appears to the Government that it would be an arrangement not only inconvenient, but without precedent, to establish in one metropolis three Universities—Trinity College (the University of Dublin), the Queen's University, and the University which is proposed to be created by this Bill—and that it would be still more indefensible to adopt that course, when you consider that two of these Universities would be performing exactly the same functions—namely, examining for degrees—with only a trifling distinction. We, therefore, propose that as soon as the University to which I have referred is constituted by Royal Charter, steps shall be taken for the dissolution of the Queen's University."
>
> . . . . . .

Now, so far from the Queen's University being an afterthought grafted upon the original design of the Queen's Colleges, as represented to Parliament by Lord Cairns, it was an essential part of that original design. In introducing the Queen's Colleges' Bill in 1845, on behalf of the Government, Sir James Graham said (Hansard, Third Series, Vol. 80, col. 358)—

> "I should still leave the statement most imperfect if I did not glance at other important and peculiar circumstances connected with it. The Bill I propose to bring in does no more than propose to build and establish those Colleges in Ireland; but the great question that presents itself is—shall these three Colleges be associated together in one University? or, following the example of Scotland, shall the Crown, in the exercise of its prerogative, endow each of these Colleges with the power of granting degrees in Arts, Sciences, and in Medicine? Now, sir, it is not necessary—and, as I think, it would not be expedient—in the present Bill, and at the present time, to fix and carry out any definite arrangement on that point. It is not necessary on the one hand; while, on the other, I hold it to be important that we should ascertain what amount of success attends this first step—and it is a large step—in advance, before that question is finally decided. At the same time, I will not be so deficient in candour as not to state what is my own opinion of the matter. I think that the advantages in favour of a Central University decidedly preponderate. . . . . This brings me to the question, if we are to have a Central University for Ireland, with which these Colleges shall be in connection, where shall it be? Now, upon this point I am bound to say that, considering all the circumstances of the case, and having come to the conclusion that there should be a Central University, in which all these Provincial Colleges should be associated, I think that Central University should be in the metropolis of Ireland."

It thus clearly appears that the constituting of the Queen's Colleges a University was an essential part of the design laid before Parliament in 1845, and that the only question which the Government reserved was whether each College should have University powers, or whether they should be associated together. The view of the Government as to the necessity of the University was accepted by Lord Palmerston, who spoke as follows on behalf of the Opposition. (Hansard, Third Series, Vol. 80, col. 408.)

> "Sir, I agree entirely with those who consider this Bill as only a foundation which requires a superstructure in order to make the plan complete. It will be found absolutely necessary to establish some central point, probably in connection with Trinity College Dublin, which will combine these different Colleges into one University, and will, if possible, connect Trinity College with it as a component part. When I consider all the difficulties with which the arrangement of the details must be attended, I am far from blaming Her Majesty's Government for not having made that aggregate University a part of their present proposal; but, as the same time, I must say their measure will be incomplete if, sooner or later, they do not combine with it a larger arrangement of that nature."

Accordingly, as soon as the Colleges were ready to receive students, steps were taken to incorporate the University which was to complete them. The Act under which the Queen's Colleges were founded passed in 1845. Four years were spent in building and preliminary arrangements. It was not till November, 1849, that the Colleges were opened for the reception of students, and in the following year the Queen's University was founded to unite them into one institution, and to complete the education which they give. There was no such interval of some years as Lord Cairns imagined. Even the short interval of months, rendered necessary by the formalities that had to be gone through in preparing the University Charter, was provided for by the creation by the Government of a

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Special Temporary Board, which discharged the University functions for the time, whose regulations were acted on in the Colleges from the beginning, and were adopted as the first ordinances of the University as soon as it was constituted. Thus, from the very first, the Colleges started as parts of one great organisation, and neither in the original design, as laid before Parliament, nor in the actual order of events, was there any foundation for the representation made by Lord Cairns.

Lord Cairns was equally unfortunate when he ventured the statement to Parliament that the Queen's University was "simply an Examining Body." Nothing can be further from the truth. In its initial conception, by the terms of its Charter, and in the way in which it has been worked, the Queen's University is not a mere Examining Board, nor is it a distinct institution from the Queen's Colleges, but they together form one institution, the main and important function of which is to teach. The buildings of the Queen's Colleges are not Colleges in the English acceptation of the word, *i.e.*, they are not buildings in which students reside. They are the lecture halls in which the instruction of the University is given at three distinct stations, and they thus correspond exactly with the University buildings of the Scotch or Continental Universities.

To mark emphatically that instruction in the Colleges is the instruction of the University, the University Charter provides that the Professors in the Queen's Colleges are Professors of the University; and the maintenance of this relation is ensured in the most substantial way by the duties imposed upon the University Senate. It is this central authority which prescribes what shall be taught, whether at Belfast, Cork, or Galway, as a condition for a degree; in what order the studies shall succeed one another; how long each shall be pursued, and what option shall be allowed to the students, and this teaching, so prescribed by the Senate, is given simultaneously by the University Professors in the three Queen's Colleges. The University Senate also lays down the examinations which the students are to pass in common, and for that purpose brings together, in Dublin, nearly its whole staff of Professors, and forms them, along with some external examiners, into Boards of Examiners, by whom the students are examined. The University has thus been in a position to weave its teaching and examining into one consistent whole, and this it has done with the utmost care.

So far from the Queen's University being "simply an Examining Board," as alleged by Lord Cairns, it is a University of the strictest academical type that has yet been seen in the British Isles. To teach is its predominant function, and it has, with signal success, applied itself to subordinate its examinations to its more important function of teaching; to render its examinations such as will best co-operate with the instruction instead of controlling it, and to do what in it lies to counteract the baneful effects on higher education of "the examination fungus," which is abroad. Its examinations, as already explained, are mainly conducted by its teachers; its regulations for these examinations are largely based by its governing Senate on reports received from these teachers. Its examiners, being experienced teachers, are of the class who make the most efficient examiners, and they are subjected to the best checks yet contrived for insuring the full discharge of their difficult duties, inasmuch as they are the persons most interested in improving the examinations entrusted to them; and inasmuch as they fulfil their functions under the observation of colleagues as expert as themselves. The University examinations, and the instruction given to the students in the Colleges, have thus been brought by the experience of thirty years into such healthy relation, that they together tend in an eminent degree to promote the higher forms of instruction, and to discourage cramming.

It is this support given by the examinations and the instruction to each other, and the combination of both in the case of every candidate who obtains a degree, which are the distinguishing features of the culture of the Queen's University, a system of culture every part of which is in broad contrast with that which it has been made the duty of the new University to evolve. It was, therefore, an entire misapprehension on Lord Cairns' part to suppose that the new University and the Queen's University, if allowed to co-exist, "would be performing exactly the same functions with only a trifling distinction."

This admirable system has been *fully* carried out in all the faculties except that of Medicine, and in Medicine it has been carried out as far as the exigencies of Medical education allow. All the graduates in Arts, Law, and Engineering of the University, and they are the most numerous body of its graduates, have received their *whole* training under this system, and the great majority of its graduates in Medicine have received most of their training under it. By careful statistics, extending over ten years, it was ascertained that the *average* stay of a student under instruction in the Queen's University is over three years—a period sufficient for effectual training—and this average has taken account of every student however slenderly connected with the University. There were last session 958 students receiving instruction in the halls of the Queen's University, and the numbers are year by year on the increase, a great work, when it is borne in mind that until the Queen's University was founded no students in Ireland obtained a true University training except those students of Trinity College, Dublin, who did not avail themselves of the permission given by the University of Dublin to seek degrees by examination only.

A University degree may mean much, or it may mean little. Its real significance is not known until the University is named in which it has been obtained, and it reflects credit on the Queen's University that it has gained the respect and affection of the great body of its graduates. It is now proposed that the graduates of a University whose reputation has been slowly and worthily won and is steadily rising in the estimation of educated men, shall be compelled to resign the title which they have laboriously earned, which they lawfully hold, and of which they are justly proud, for the degree of a University of an essentially different type, and whose reputation has yet to be made.

Convocation earnestly deprecates the extinction of the Queen's University, because it would be an unprecedented invasion of the lawful and highly valued rights of its graduates, but far more earnestly because it would destroy that admirable type of education which has grown up in the Queen's Colleges, the work of thirty years, and would force those institutions to begin again and shape their new course as best they can towards a less perfect ideal.

It appears from the Act of 1879 that it was not the intention of the Government or Legislature to injure the Queen's Colleges; and it further appears that the legislation in its present form was carried under an entire misapprehension of the true relation of the Queen's University to the Queen's Colleges. If the importance of this relation had been sufficiently appreciated, it may, perhaps, be questioned whether Parliament would have inflicted so great an injury upon higher education in Ireland, or interfered so seriously with the personal rights of individual graduates.

As the cost of maintaining the Queen's University is only about £4,500 a year, Convocation assumes that the saving of this small sum cannot have been the motive for the dissolution of the University.

Convocation feels so strongly the injury which would be inflicted on the members of the University (in some cases expected to lead to pecuniary loss), as well as that done to the cause which they have at heart, that it earnestly desires a reconsideration of the position of the University, taking into account the real facts of the case.

By Order,
JAMES WILSON, M.A., LL.B.,
Clerk of Convocation.

Queen's University,
November, 1880.

APPENDIX III.

DEPUTATION from the Queen's University to the Lord Lieutenant of Ireland.

His Excellency the Lord Lieutenant and the Right Hon. the Chief Secretary for Ireland received a deputation from the University, according to the request of Mr. Gladstone, on the 9th December, 1880.

The following members of the University formed the deputation:—

A. M. Porter, B.A., Q.C.,
Hans M'Mordie, M.A.,
G. Johnstone Stoney, D.Sc., F.R.S., Secretary of the University.

} Representatives of Convocation on the Senate of the University.

T. K. Wheeler, M.D., Representative of the Belfast Graduates' Association.
Rev. Wm. Johnston, B.A., Representative of the London Graduates' Association.
Matthias O'Keeffe, M.A., M.D., Professor, Cork.
A. H. Corley, M.D.
J. Walker Craig, M.A.
Alfred Edgar, B.A.
Rev. B. C. Davidson-Houston, B.A.
R. R. Kane, M.A., LL.B.
Charles Knight, M.D.
Rev. A. C. Murphy, M.A.
A. O. B. O'Conor, B.A.
Stephen Ronan, B.A.
William Thomson, A.B., M.D.
Thomas J. Wall, B.A.
J. O. Wylie, LL.D.
James Wilson, M.A., LL.B., Clerk of Convocation.

The following members of the deputation addressed His Excellency:—

Dr. Stoney, Mr. Porter, Mr. M'Mordie, Mr. Wall, Rev. Mr. Davidson-Houston, Dr. Wheeler, Dr. Corley, Dr. Thomson, Dr. O'Keeffe, Rev. Mr. Johnston, and Mr. Ronan.

The deputation was received and listened to with great courtesy by His Excellency and the Chief Secretary. His Excellency said he would lay before the Prime Minister the views which had been presented to him.

APPENDIX IV.

MEMORANDUM on the History of the Queen's University in its relation to recent Legislation, prepared by direction of the Senate of the University.

The Senate of the University to Mr. Gladstone.

Queen's University,
Dublin Castle,
28th December, 1880.

SIR,—I am desired by the Senate of the Queen's University in Ireland, to request you to lay before Mr. Gladstone the annexed memorandum on the History of the University which the Senate has drawn up for the information of Her Majesty's Government.

I am, Sir,
Your most obedient Servant,
(Signed), G. JOHNSTONE STONEY,
Secretary to the University.

E. W. Hamilton, Esq.

MEMORANDUM.

In 1845, Her Majesty's Government asked Parliament to provide University Education in Ireland, which should be open to all denominations. In the Bill which was submitted, and which became the Colleges Act of 1845, an endowment was given for three Colleges, and provision made for increasing the number if it should be desirable.

The Government explained to Parliament that these Colleges were either to be united in one University, or endowed separately with University powers. Lord Palmerston, on the part of the Opposition, concurred in the necessity of there being a University, but argued that it would be better that they and Trinity College, Dublin, should be united in one University. The Government met this argument, by pointing out that the new Colleges would be undenominational, while Trinity College was a denominational College, and that it was not desirable to bring together denominational and undenominational Colleges in one University.

When the Act passed, the erection of College buildings at Belfast, Cork, and Galway, was proceeded with, and the Queen's Colleges were ready for the reception of students in the Session 1849-50.

As the University Charter had not yet been issued, the Government convened a special Board to discharge for a time the University functions. This Board consisted of the Presidents and Vice-Presidents of the three Colleges, and it was they who laid down the regulations in regard to studies under which the Queen's Colleges opened, regulations which were adopted by the University as its first ordinances, when the University some months later was legally constituted. Accordingly, the Queen's Colleges, from the first, were parts of one homogeneous University organisation, although the Charter which gave legal force to the University powers and made the teachers in the Queen's Colleges University Professors, did not pass the great seal for some months after the Colleges of the University opened.

These ordinances continued with but little change to regulate the education in the Queen's University, for several years. Meanwhile events occurred outside the University, which had an important bearing on its future destiny, and to which it is therefore necessary to refer.

In 1854 the great debates took place in Parliament which issued in the reform of the Universities of Oxford and Cambridge. This reform amounted to a revolution, as it transferred the legislating power in these Universities from the heads of houses and principal University officers, by whom it had been previously exercised, to bodies created by the Acts of 1854 and 1856, in which the chief influence is vested in the persons engaged in teaching in the University, whether as Professors, College tutors, or private tutors. Substantial power is also allowed to the graduates at large, while to the heads of houses and University officers a considerable share is also assigned, though less than that transferred to the other resident members of the University.

Full preparation was made for these important debates in Parliament by the exhaustive inquiries of the Royal Commissions which preceded them; and during their continuance all the parties in the Universities used their most strenuous efforts that their respective views should be fully considered. One result of this has been that the record of this legislation, as it stands in the pages of Hansard, is, perhaps, the most instructive chapter in the history of the Universities of Great Britain.

The Queen's University had, however, been planned before these debates in Parliament threw their abundant light upon the proper constitution of Universities. The Professors were omitted from its Governing Senate, and no provision was made that the graduates, as soon as they should become a sufficient body, should be allowed a share of influence. The precedents, in fact, that were followed, and it must be admitted were very properly followed, were those of the unreformed Universities of Oxford and Cambridge. And had it been otherwise, it would have been impracticable in the first years of a University, and before its teachers had acquired experience, to have brought into real effect the principles established in 1854. But an episode which occurred in the history of the Queen's University indirectly brought about this result in a very complete way.

In 1857 a Royal Commission was issued to inquire into the Queen's Colleges, and amongst other matters the Commissioners inquired fully into the effect of the legislation of the University on the instruction in the Colleges. By this means a voluminous and very complete criticism of the regulations of the University was elicited from its Professors. Fortunately, this inquiry was not entered upon until the Professors had acquired some years' experience as University teachers, and were in a position to give an enlightened opinion upon the topics about which they were examined; for there is no class of subjects in reference to which the plausible more frequently differs from the true, and in which theorists will accordingly be more in risk of feeling confident, while in reality going astray. The body of evidence collected at that time has been of inestimable service to the University. It exposed every weak point which experience had shown to exist in the legislation originally adopted in the University, and it also in many cases pointed out the remedies.

Shortly after this important evidence was published, the attention of the Senate was occupied upon it, and with great wisdom they subjected the then existing regulations of the University to a careful scrutiny, which resulted in their introducing important, and, in some instances, fundamental amendments into the curricula of the Faculties of Arts, Law, and Engineering. There were obstacles at the time to the application of a similar treatment to the Faculty of Medicine;

DOCUMENTS, X.

but by a succession of steps since taken, this faculty also has been brought into harmony with the light then and subsequently obtained, and there is, perhaps, no faculty of the University in reference to which on the whole a greater amount of improvement has taken place.

The next event of great significance to the University was the advent into the Irish Office, in 1859, of Mr., now Lord, Cardwell. Lord Cardwell had been actively engaged in connection with the legislation a few years before, which reformed the Universities of Oxford and Cambridge, and he was deeply imbued with the principles of that legislation. It is rare to meet a statesman who has the intimate acquaintance which he had of the affairs of Universities, and of the fundamental principles of University legislation. He saw the defects in the Queen's University and in its Colleges, which were the natural result of their constitution having been framed at a time when no statesman was possessed of the knowledge that had afterwards been elicited by the debates in Parliament in 1854, and the inquiries at Oxford and Cambridge, which preceded them. Accordingly, under his direction, amended Charters for the Queen's Colleges and the Queen's University were drafted, by which he proposed to give to these institutions the more advantageous constitution and provisions which the discussion of University questions in Parliament had shown to be attainable.

Unfortunately, Lord Cardwell left the Irish Office shortly after he had completed the drafts of these Charters, and it devolved on his successor, who, of necessity, had not the same intimate knowledge of the details of these documents, to propose them for the acceptance of the Corporations of the Colleges and University. It was almost a necessary consequence that the drafts prepared by Lord Cardwell suffered some loss in obtaining that acceptance; the chief loss being, so far as concerns the present memorandum, that the clauses in which Lord Cardwell had proposed that the Professors should send six representatives to the Senate were struck out, and a clause was introduced forbidding Convocation to elect a Professor. This loss has in some degree been remedied by the subsequent action of the Crown, which, in the exercise of its discretion, has appointed Professors to fill some of the vacancies on the Senate which have since arisen.

Although this provision was lost, a very important advance was made by these Charters. By them the Corporation of the University was extended beyond the Senate, to which it had previously been limited, so as to include the Professors, graduates, and students of the University. Convocation also was called into existence, and endowed with substantial powers. And, above all in importance, when measured by the effect on the subsequent progress of the University, was the provision which entrusted most of the University examinations to the University Professors, acting in Boards and under checks, which have caused the arrangement to work most advantageously.

This system not only committed the University examinations to the persons most competent to conduct them, but, indirectly, too, it has had very important effects. It has secured an annual conference between the three Colleges, and has blended the whole University into one homogeneous body. It has enabled the Senate annually to obtain the assistance of the University Professors in determining and varying the details of University legislation. Each College has, through its means benefited by the experience of the other two. The courses of instruction for the ensuing session are arranged at each annual conference, so as sufficiently to correspond with one another in the three Colleges, while at the same time the teaching in the Colleges has been freed from the deadening pressure of external control, and given all the vitality of spontaneous intellectual work. It is further to be observed that the functions of each examining Professor are discharged in the presence of colleagues who are equally experts with himself; and by all these means co-operating with one another the whole vigour, tone, and quality of the work done in the University have been raised to an unusual height.

In Lord Cardwell's Charter care was taken to preserve the power given in the Colleges Act of 1845, by making provision for a possible increase of the number of Colleges in the Queen's University, and this provision stands part of the Charter as it now exists.

In 1862 the Queen's University established local examinations for the examination of candidates not educated at its Colleges, and gave to the candidates who satisfied the examiners at these examinations certificates analogous to those issued in like cases by the Universities of Oxford and Cambridge. This branch of the University's work was, some years later, extended to women, and has proved of eminent service. The University of Dublin afterwards opened similar examinations for women, and these local examinations of the Queen's University were also the precursors of the Intermediate examinations which have recently been established in Ireland by Act of Parliament.

The next event which deeply affected the University was the offer made to it in 1866 of a supplementary Charter, which proposed to open its degrees to all persons who presented themselves for examination, whether they had undergone a University training or not. The experience of the London University had shown that the exercise of this power led inevitably to the loosening of the connection between a University and its Colleges, and was incompatible with the maintenance of true University Education. The offer was, accordingly declined.

Since 1866 the career of the University has been one of continuous attention to its duties and the diligent discharge of them. The admirable mode of conducting the University examinations, established in 1863, has bound the whole institution, the University and its three Colleges, into one homogeneous structure. It has enabled the Queen's University to introduce, without delay, and according as they arise, such improvements into all branches of its work as the advance of knowledge or the progress of events make possible, and it has thus enabled this University to advance in the foremost rank among the Universities of the United Kingdom. The practical examinations which the Queen's University has, of late years, introduced into its Medical curriculum, may be given as one out of many instances of this. The Queen's University was the first of the licensing bodies in Ireland to adopt practical examinations as a part of its Medical education, and it has been able to raise some of them to a condition of unequalled efficiency.

The reputation of the Queen's University among educated men has constantly and deservedly been on the increase. The appreciation of the public is shown by the steadily increasing number of candidates who seek admission to its halls, and the prevailing seriousness of their studies while there. The labours of the Queen's University have, in fact, more than doubled the number of persons in Ireland who receive a true University Education. Three hundred and thirty-eight new students obtained admission to its instruction last session; 958 were taught; and these numbers are not the limit, they are still annually on the increase. The average stay of a student under instruction has been found to be more than three years. The work of the University is thus not only of the highest quality, but is also being carried out on a large scale, and producing a proportionately large amount of good in Ireland. The quality of this work could not be maintained if the intimate bond between the University and its Colleges is severed.

By order of the Senate,

G. JOHNSTONE STONEY, D.SC., F.R.S.

Secretary to the University.

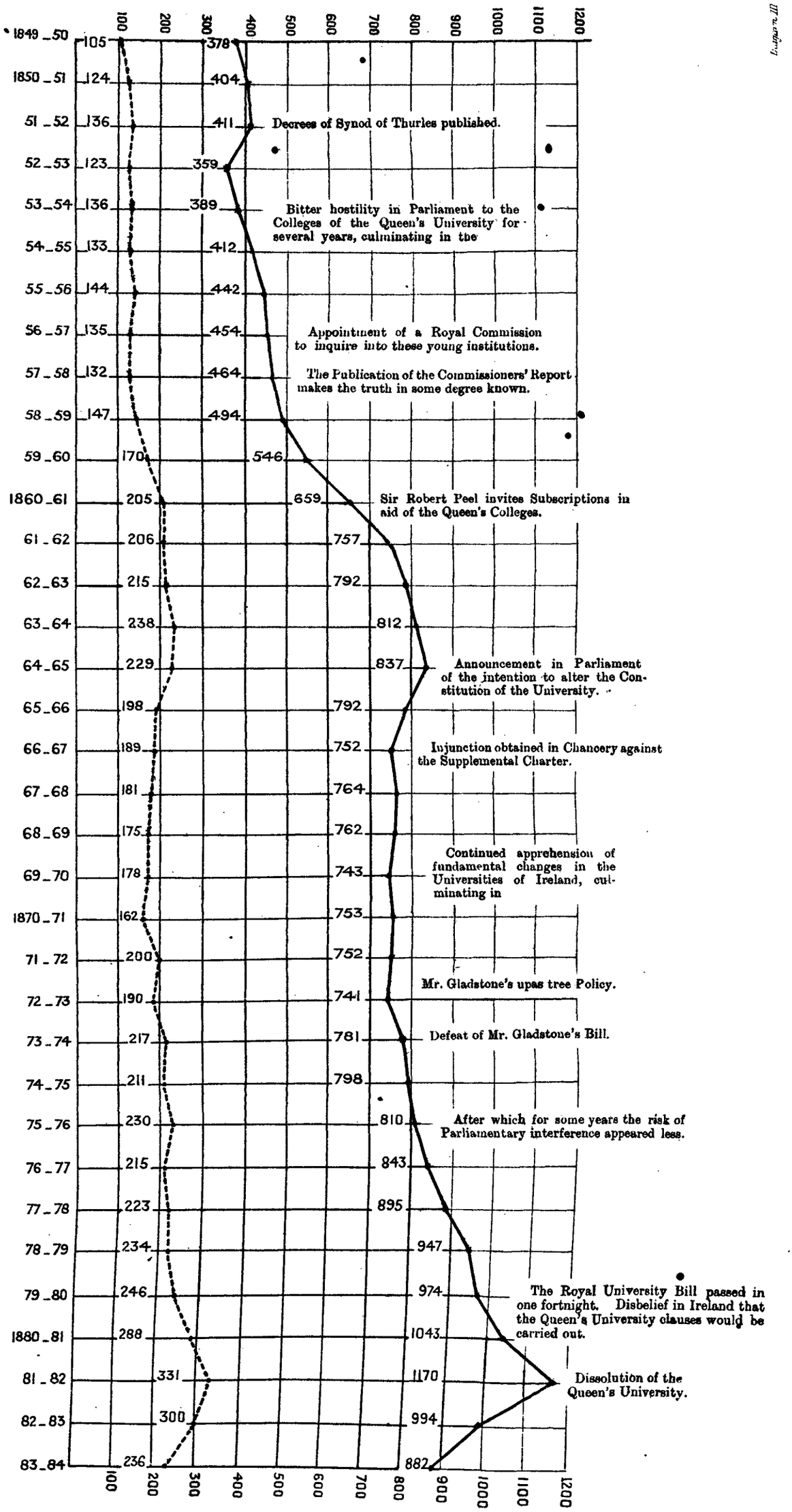
Queen's University,
December 21, 1880.

Diagram put in by Dr. Johnstone Stoney, showing the Fluctuations in the Numbers of Students attending the Colleges of the Queen's University, with Notes indicating the causes of the Fluctuations.

(See the evidence of Dr. Johnstone Stoney, p. 196.)

The number of Students in each year is entered upon the Diagram.

The dotted line represents the Number of Catholic Students.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73_74 217 781
74_75 211 798
75_76 230 810
76_77 215 843
77_78 223 895
78_79 234 947
79_80 246 974
1880_81 288 1043
81_82 331 1170
82_83 300 994
83_84 236 882
Decrees of Synod of Thurles published.
Bitter hostility in Parliament to the Colleges of the Queen's University for several years, culminating in the
Appointment of a Royal Commission to inquire into these young institutions.
The Publication of the Commissioners' Report makes the truth in some degree known.
Sir Robert Peel invites Subscriptions in aid of the Queen's Colleges.
Announcement in Parliament of the intention to alter the Constitution of the University.
Injunction obtained in Chancery against the Supplemental Charter.
Continued apprehension of fundamental changes in the Universities of Ireland, culminating in
Mr. Gladstone's upas tree Policy.
Defeat of Mr. Gladstone's Bill.
After which for some years the risk of Parliamentary interference appeared less.
The Royal University Bill passed in one fortnight. Disbelief in Ireland that the Queen's University clauses would be carried out.
Dissolution of the Queen's University.

XI.

Documents put in by the Right Rev. Monsignor Mercier, President of the "Institut Supérieur de Philosophie" in the University of Louvain.

(1.)

A NOTE of some of the PRINCIPAL PROFESSORS in the old UNIVERSITY of LOUVAIN.

(See the evidence of Monsignor Mercier, q. 7207.)

Pope Adrian VI. (born at Utrecht in 1439, and deceased at Rome, the 14th September, 1523) made brilliant studies in Theology at the University of Louvain, where he occupied for some time the Chair of Theology, and soon afterwards became Vice-Chancellor.

Without insisting upon the intervention of the Faculty of Theology in the religious controversies of the sixteenth and seventeenth centuries, let me recall, besides the name of Baius, the part which was taken by the theologians in the Council of Trent, in the reproval of Gratian as well as the publication of a polyglot Bible, printed in five languages, by Plantin.

As for literature, "humanisme" found in the University of Louvain obstinate defenders, amongst whom we find personal friends of Erasmus. All have heard of the renown of Justus Lipsius. But it is only just to quote Nicolas Cleynærts, the inventor of a new grammatical method, which contributed not only to the study of Greek, but also to the study of Hebrew and Arabic; Martin Dorpius, to whom we owe a renaissance in Literature, and Paludanus, who, as well as Dorpius, was the near friend of Thomas Morus, and was commissioned, in collaboration with another Belgian, to superintend the first edition, issued at Louvain, of the Utopia.

In the Medical work, Louvain can quote Vesalius and lesser celebrities, such as Rega, Verheyen, and Villers.

Among the jurists of the old University some acquired a great reputation abroad. In the sixteenth century Mudæus renewed the method of Roman Law; in the seventeenth century A. Perez drew up one of the first treatises of Common Law in our country, inclusive of International Law; at the end of the same century Stockmans made a great name for himself, thanks to his intervention in the famous question of Devolution, whereas Van Espen became famous by his "Statolatric" doctrines with regard to Ecclesiastical Law. Lastly of all, let us mention the Natural and Physical Sciences, and quote Gemma Frisius, who introduced in Belgium, in the sixteenth century, the Mathematical and Ptolemean revival; Adrianus Romanus, who is considered as one of the creators of Algebra, and Minckelers, who invented the use of gas.

(2.)

A LIST of some DISSERTATIONS recently (1900, 1901) written for the Licentiate and for the Doctorate in the Philosophy of St. Thomas by students of the UNIVERSITY of LOUVAIN.

(See the evidence of Monsignor Mercier, q. 7220.)

1. Das Moralprincip nach Kant und S. Thomas (1900).
2. Kants Bestimmung der Sittlichkeit (1901).
3. Kant dans l'apologétique moderne (1901).
4. Le néo-criticisme de M. Renouvier (1901).
5. La casualité et la finalité selon M. Boutroux (1900).
6. Le problème critériologique d'après Herbert Spencer (1900).
7. Etude critique de l'esthétique de Spencer (1900).
8. Origine de l'idée religieuse dans l'évolutionisme Darwinien et Spencérien (1900).
9. Stuart Mill et la méthode traditionnelle en Sciences Sociales (1900).
10. La sociologie de Comte et la sociologie catholique (1901).
11. Karl Marx, sa doctrine considérée en relation avec sa vie (1901).
12. La Sociologie d'Auguste Comte. Exposé et Critique.

(3.)

A LIST of the DEGREES obtainable at the UNIVERSITY of LOUVAIN.

(See the evidence of Monsignor Mercier, q. 7225.)

1. Bachelorship, Licentiate, and Doctorate in Divinity and Canon Law.
2. Bachelorship and Doctorate in Law.
3. Candidature *en Notariat* (Notary).
4. Bachelorship, Licentiate, and Doctorate in Commercial and Consular Sciences.
5. Bachelorship, Licentiate, and Doctorate in Political and Social Sciences, in Political and Diplomatic Sciences.
6. The different degrees of Medicine, Surgery, and Pharmacy.
7. Bachelorships and Doctorates in Philosophy and Literature (Arts).
8. Moral and Historic Specialities of Philosophy.
9. Special degrees in Superior Philosophy and Aggregation to the School of Thomas Aquinas.
10. Various degrees in Natural, Physical and Mathematical Sciences; Botanical, Mineralogical, Chemical, and Geographical specialities.
11. Special Schools and Degrees of Mining Engineers, Civil Constructions, Arts, and Manufactures, Architecture and Electricity.
12. Degrees of Agricultural Engineers, of Experts in Chemical Agriculture.
13. Degree of Engineer for Brewing.

(4.)

REVIEWS published by the UNIVERSITY of LOUVAIN.

(See the evidenceof Monsignor Mercier, q. 7226.)

1. Analectes, Contributions to the Ecclesiastical History of Belgium.
2. Practical Review of the Civil and Commercial Societies.
3. The Medical Review.
4. Annals of Pharmacy.
5. The Museon.
6. The Revue Néo-scolastique.
7. Sommaire ideologique des ouvrages de philosophie.
8. La Mouvement Sociologique.
9. Dietsche Warande.
10. Louvain transactions.
11. La Cellule (the Cell): a collection of Cytology and General Histology.
12. Union of the Engineers from the Special Schools of Louvain.
13. Agricultural Review.
14. Bulletin (Review) of the Association of the Ancient Scholars of the Louvain Brewing School.
15. Le Musée Belge (the Belgian Museum): a Bibliographical and Pedagogical Review.
16. Le Névraxe: a Collection of Neurology.
17. La Revue Sociale Catholique (the Catholic Social Review).
18. La Revue d'Histoire Ecclésiastique (the Review of Ecclesiastical History).
19. La Revue Catholique de Droit (the Catholic Law Review).

DOCUMENTS, XI.

(5.)

LIST of Laboratories, Seminaries, Conferences, Societies, &c., founded at the University of Louvain.

(Cfr. Year Book of Catholic Louvain University, 1901. Van Linthout, Louvain.)

(See the evidence of Monsignor Mercier, q. 7226.)

I.—NATURAL SCIENCE LABORATORIES.

1. Various Chemical Laboratories (for General, Analytical, Agricultural, Analytical and Agricultural, Industrial, Physiological, Pharmaceutical, Biological, Chemistry, &c., respectively).
2. Several Physical Laboratories.
3. Special Electrical Laboratory.
4. Laboratory of Experimental Psychology.
5. Laboratory of General Cytology and Histology.
6. Laboratory of Comparative Vegetal Histology.
7. Laboratory of Animal Histology.
8. Laboratory of Embryology.
9. Laboratory of Zymotechnic.
10. Laboratory of Zoology and Comparative Anatomy.
11. Laboratory of Neurology.
12. Laboratory of Hygieina.
13. Laboratory of Physiology.
14. Laboratory of Bacteriology.
15. Laboratory of Pharmaco-Dynamics.

II.—MUSEUMS.

To almost all Laboratories a special Museum is attached.

III.—SEMINARIES AND CONFERENCES WHERE PROFESSORS AND STUDENTS MEET TO DISCUSS THEIR HISTORICAL, SOCIAL, AND PHILOSOPHICAL STUDIES.

1. Historical Seminary, principally used by the students in Theology, Philosophy, and Letters.
2. Historical Seminary of Mediæval Philosophy.
3. Conference of Social Philosophy.
4. Conference of Social Economy.
5. Historical Conference of Greek and Latin Literature.
6. Conference of Ancient and Modern Political History.
7. The Societas Philologa.

IV.—LIBRARIES.

In addition to the large General Library of the University, several institutions and conferences possess a special library for their scientific departments. These libraries are to be used only by the respective members of those institutions or conferences.

V.

An International Office of Philosophical Bibliography exists at the Superior Institute of Philosophy.

VI.—STUDENTS' CLUBS UNDER THE DIRECTION OF PROFESSORS FORMED FOR THE PURPOSE OF PROMOTING SCIENTIFIC OR LITERARY STUDIES THROUGH ORIGINAL WORKS AND DISCUSSIONS.

1. Philosophical Society.
2. Social Club (Cercle Social).
3. Society of Flemish Literature: "Met Tyd en Vlyt."
4. Society of National Flemish History: "Constantius Buter."
5. Flemish Club of Social Studies: "Sprekersbond en Sociale Studiekring."
6. French Club of Social Studies: "L'Emulation."
7. Industrial Club.
8. Flemish Club of Agricultural Studies: "Landbouwkring."
10. Flemish Club of Law Studies: "Rechtsgenootschap."

(6.)

LETTER to Monsignor Mercier from the CARDINAL ARCHBISHOP of MALINES.

(See the evidence of Monsignor Mercier, q. 7210.)

Malines,
Sept. 29*th*, 1901.

MONSIGNOR,—I hasten to answer the letter you were kind enough to send me. The Bishops have not published any special instructions with regard to attendance at non-Catholic Universities. They have, however, both collectively and individually, called the attention of parents several times to the obligation which these latter are under, of not entrusting the education of their children to any but Catholic teachers. These instructions of the Bishops apply as well to establishments of higher education as to Intermediate and Primary Schools.

The Belgian Hierarchy is then very far from ever having allowed the youth to frequent Universities, of which the Professors have the liberty of teaching doctrines contrary to our faith.

With regard to parents who send their children to such Universities, it is the duty of confessors to enlighten them, and to direct their consciences in accordance with the principles of sound Theology.

I may add, Monsignor, that, if Belgium had not the happiness to possess a Catholic University, the Belgian Hierarchy would consider it an imperative duty to establish one.

Believe me, Monsignor,
Yours affectionately in Christ,
P. L., Archbishop of Malines.

(7.)

LETTER from the BISHOP of BRUGES to the Rectors of all the Colleges in his Diocese.

(See the evidence of Monsignor Mercier, q. 7264.)

Bruges,
April 28*th*, 1901.

REV. PRESIDENT,

REV SIR,—For some time past, it seems our youth, who have completed their studies in our Catholic Colleges, think themselves authorised, for various reasons, to attend other Universities in preference to our Catholic University of Louvain.

I consider it my duty to call your attention to this abuse, and I beg you to fight against it with all your might; to instruct, if need be, the parents, and to refute the false reasons that may be brought forward in favour of such a practice.

You may use the authority of the legitimate Pastors, namely, the Bishops of Belgium, to put down all pretexts and recommendations coming from elsewhere.

Believe me, my dear President,
Yours affectionately in Christ,
G. T., Bishop of Bruges.

Diagram put in by Monsignor Mercier, showing the number of Students enrolled, and the number admitted to the Examinations in the University of Louvain, since 1835.

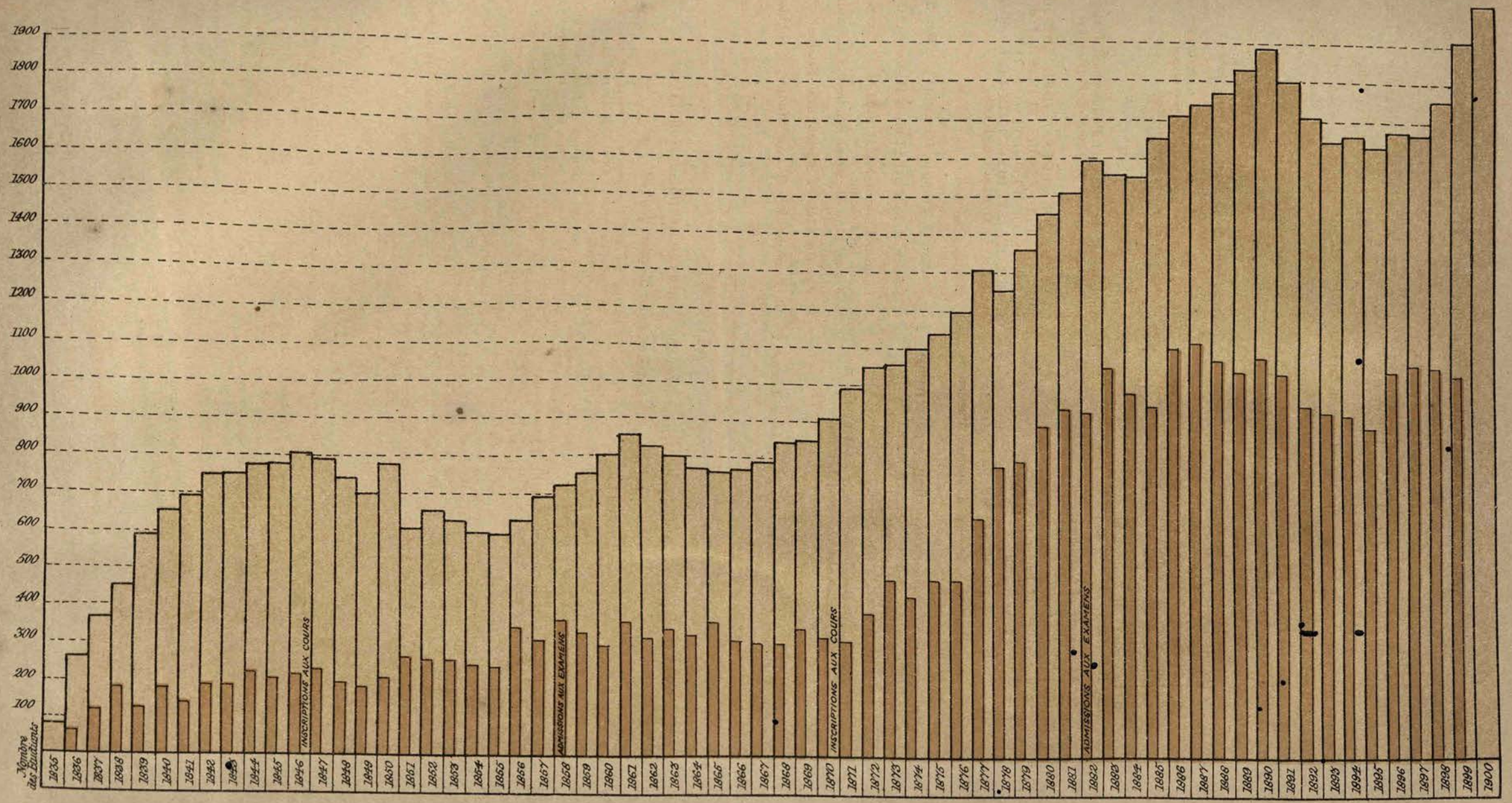

Diagram I.

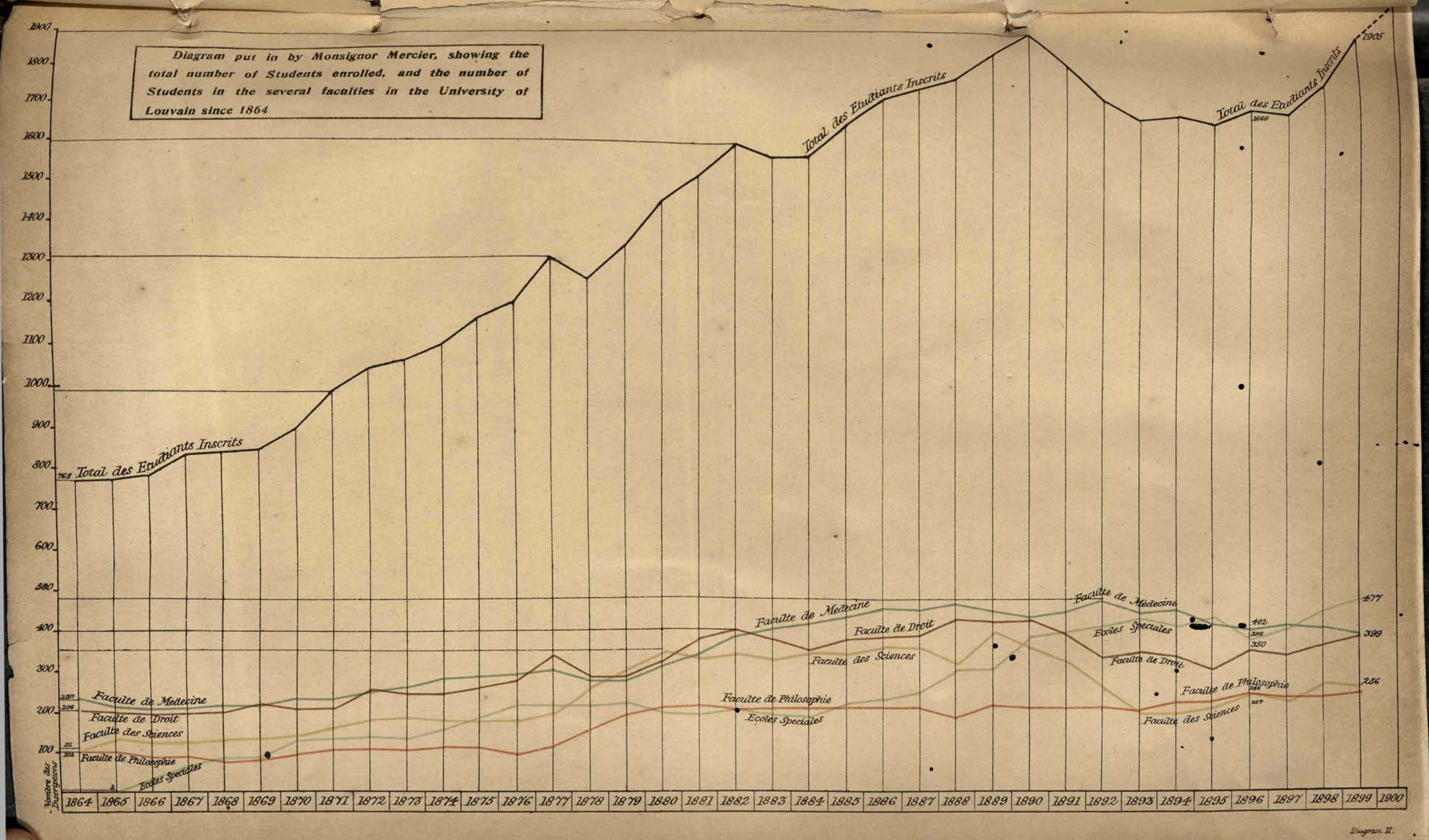
Diagram put in by Monsignor Mercier, showing the total number of Students enrolled, and the number of Students in the several faculties in the University of Louvain since 1864
Total des Etudiants Inscrits
768
Total des Etudiants Inscrits
1905
Total des Etudiants Inscrits
2669
Faculte de Medecine
Faculte de Droit
Faculte des Sciences
Faculte de Philosophie
Ecoles Speciales
250
206
221
182
Faculte de Medecine
Faculte de Droit
Faculte des Sciences
Faculte de Philosophie
Ecoles Speciales
Faculte de Medecine
Ecoles Speciales
Faculte de Droit
Faculte de Philosophie
Faculte des Sciences
402
396
350
226
227
477
399
256
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
Nombre des Inscriptions
1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900

Diagram II.

XII.

Document put in by M. Alfred Nerincx, Ph.B., LL.D., D. Polit. Sc., Professor of Constitutional Law in the University of Louvain.

STATISTICAL ABSTRACT from the Report presented by the Belgian Government to both Houses of Parliament on the state of University Education in Belgium during the Triennial Period 1897–1900.

(Rapport triennal sur la situation de l'Enseignement Supérieur en Belgique, 1901.)

(See the evidence of M. Nerincx, q. 7347.)

Total Population of Belgium (December, 1900), 6,744,532 inhabitants.

Number of Students in the Universities of Belgium :—

—	1897-1898.	1898-1899.	1899-1900.
State University of Gand, ...	701	743	757
State University of Liége, ...	1,426	1,490	1,545
Free Liberal University of Brussels, ...	1,068	975	1,018
Catholic University of Louvain, ...	1,756	1,905	1,945
The four Universities together, ...	4,951	5,113	5,265

Number of Degrees conferred by the various Faculties of each University* :—

—		Philosophy.	Law.	Sciences.	Medicine.	Theology.	Total.
State University of Gand, ...	1898, ...	46	104	107	107	—	364
	1899, ...	47	106	95	119	—	367
	1900, ...	47	109	94	138	—	388
State University of Liége, ...	1898, ...	97	138	286	172	—	693
	1899, ...	83	137	313	161	—	694
	1900, ...	80	136	358	159	—	733
Free Liberal University of Brussels, ...	1898, ...	74	132	181	280	—	667
	1899, ...	64	139	162	253	—	618
	1900, ...	60	130	214	218	—	622
Catholic University of Louvain, ...	1898, ...	164	297	262	362	16	1,101
	1899, ...	153	277	261	334	20	1,045
	1900, ...	138	269	293	327	13	1,040

*Exclusive of two Catholic Faculties of Philosophy and Science established in large Catholic Schools at Brussels and Namur, the students of which are examined by the Government Examining Commissions for Non-University graduates (*Jury Central*). *Vide* following table.

Number of *Non-University* Degrees conferred by the Government Examining Commissions :—

—		Catholic College of Brussels.	Catholic College of Namur.	Jury Central (mostly for privately taught candidates).
Degrees of Philosophy, ...	1898,	55	56	7
	1899,	62	59	10
	1900,	53	52	7
Degrees of Law, ...	1898,	—	—	44
	1899,	—	—	65
	1900,	—	—	57

—		Catholic College of Brussels.	Catholic College of Namur.	Jury Central (mostly for privately taught candidates).
Degrees of Science, ...	1898,	—	12	6
	1899,	—	21	12
	1900,	—	19	4
Degrees of Medicine, ...	1898,	—	—	57
	1899,	—	—	34
	1900,	—	—	41

XIII.

Document put in by Wm. Garnett, Esq., M.A., D.C.L., Secretary of the Technical Education Board of the London County Council.

ESTIMATE of the cost of ERECTING and EQUIPPING a COLLEGE of SCIENCE.

(See the evidence of Dr. Garnett, q. 6282.)

Cost of site, say, 1 acre, ... (?)

Cost of building to include—

Administrative Department, . .	
Department of Mathematics, . .	
,, ,, Physics, . . .	
,, ,, Chemistry, . .	
,, ,, Mechanical Engineering, ...	
,, ,, Electrical Engineering, ...	
,, ,, Surveying and Civil Engineering, . .	
	£150,000

Equipment—

	£
Mathematics & Experimental Mechanics,	3,000
Physics, ...	10,000
Chemistry, ...	6,000
Mechanical Engineering, including—	
Marine Engineering, ...	15,000
Electrical Engineering, ...	15,000
Surveying, and Civil Engineering, . .	4,000
General Furnishing, including Library Furniture, ...	7,000
Total for Equipment, . .	£60,000

DOCUMENTS, XIV.

XIV.

Report of an Advisory Committee appointed in connection with the Promotion of the University of Birmingham.

(See the evidence, p. 106.)

REPORT.

The following is the Resolution of the Management Committee constituting the Advisory Committee:—

"That Mr. Kenrick, Professor Poynting, and Mr. Arthur Chamberlain be invited to act as an Advisory Committee to report as to the best manner of employing the funds promised by Mr. Carnegie and an anonymous donor for scientific and commercial training respectively, and especially to make arrangements for a visit to America to inspect similar institutions in the United States and Canada, to report as to the building and equipment required, and to furnish an estimate of the expenses."

"That the Committee have power to add to their number."

Your Committee, since their appointment, have held ten meetings.

At their first meeting they elected Mr. Arthur Chamberlain, Chairman, and added Mr. George Hookham, Mr. Neville Chamberlain, and Professor Burstall, to the Committee.

Three of their number (Mr. George Kenrick, Professor Poynting, and Professor Burstall) paid a visit to America at the end of last year, and made a careful examination of the Colleges and Universities in the United States and Canada. Their report is annexed hereto (Schedule I.). The Committee are much indebted to these gentlemen for this able and exhaustive record.

The Committee visited the Technical Department of University College, Sheffield, and hereby express their thanks to Principal Hicks and Professor Arnold for their courtesy and kindness on that occasion.

The Committee have interviewed a number of the leading manufacturers in the city and district with a view to ascertaining the peculiarities of the industries with which they are associated, and the best means of meeting their needs, and the kind of technical knowledge desirable in the members of their staff.

The Committee have also made themselves acquainted with the facilities existing in various Colleges and Universities of England for the teaching of Science in its application to industries. In the opinion of your Committee no such teaching, complete as they contemplate it, and as it must be if it is to be successful, exists in any College in Great Britain. This encourages them to believe that a really complete Technical College would not only be of use to the industries of the district, but would attract a number of students from a much larger area; in fact, in a greater or less degree, from the whole of England.

In the following recommendations, therefore, they have proceeded on the assumption that they are not expected to advise half measures, but only such as will in their opinion effectively and completely produce the best results.

Their object has been the teaching of Science in its application to industry, and in the first place to the industries of the city and district, coupled with such technical instruction in handicrafts as will enable the students to complete their course in the University itself.

In the new technical department it will be necessary to select Professors and Instructors who have made the practical application of their subject and the teaching of it their greatest interest.

The Committee have classified the industries of the district as follows:—

1. Mining.
2. Metallurgy.
3. Engineering.
4. Chemical trades.
5. Non-Metallic trades.

They recommend that there shall be Chairs of Mining, Metallurgy, Engineering, and Applied Chemistry. (It is not necessary to make any provision for the teaching of Mathematics, Physics, or Pure Chemistry, as these subjects will be taught as at present in the College, Edmund-street, where the rooms vacated by the Professor of Engineering, and the Lecturer on Metallurgy will provide increased space for the Physical and Chemical Laboratories.)

The Professor of Mining, who must have a special knowledge of Geology as applied to Mining and Prospecting, would deal with his subject up to the pit's bank or mine's mouth.

The Professor of Metallurgy would deal with the ores of iron, steel, copper, zinc, nickel, gold, silver, lead, antimony, and aluminium, from the mine's mouth to their reduction into a condition ready for the handicraftsman, and his subject would include fuel and gas and furnace construction.

The students in both Mining and Metallurgy would attend the lectures of the Professor of Geology.

The Professor of Engineering, in addition to giving instruction suitable for students in Engineering, would, with the aid of Assistant Professors and Instructors, supervise the manual training and the teaching of the application of Mechanical Science to the leading trades of the district.

All students in Mining, Metallurgy, and Engineering, would be expected to take the course in manual training, which would include Joinery and Pattern Making, Foundry, Smith's Work, and Fitting, Turning, and Machining.

The Professor of Applied Chemistry would, with the aid of an Instructor, supervise process Chemistry, in a department that might be called the Department of Applied Chemistry, where the leading processes in which Chemistry is utilized in the trades of the district would be practically taught.

The students should be divided into two classes, viz.:—

(1) Those taking a four-years' course in Mechanical (including Electrical), Civil or Mining Engineering, Metallurgy or Applied Chemistry, who would study for a Master's Degree in their respective subjects. At the conclusion of this course facilities would be offered for further study and research to those who could give the time or should wish to proceed to the Doctor's Degree.

(2) Those taking a course of from one to three years in any of the above subjects with a view to the practical application of the teaching to a particular industry. With such students less time could be devoted to theory, as attention would have to be concentrated on methods and results. Their work in these courses would be recognized by class certificates.

Considering now the requirements of the four Professors to enable them to give complete instruction in their particular Sciences.

The Professor of Mining (who would be closely associated with the Professor of Geology) would need a lecture room, a large laboratory well equipped with models, plans and drawings, and another with samples of the actual machines, such as stamps, crushers, &c., used in the reduction of ores (this he would share with the Professor of Metallurgy). He would also rely upon visits to such mines as were within his reach for the teaching of a great part of the practical side of his subject.

The Professor of Metallurgy would need, in addition to a lecture room, a Siemens-Martin and a Bessemer furnace, a cupola for the melting of iron, pot furnaces for steel, copper, and other metals; in fact, a com-

plete outfit for the treatment of metals by heat and a small plant for treatment by electricity; a Chemical Laboratory independent of the laboratory of the Professor of Applied Chemistry; a complete outfit for the mechanical testing of metals (this he would share with the Professor of Engineering), and a Micrographical workroom and facilities for Pyrometrical tests.

The Professor of Engineering would require, in addition to lecture rooms and a large room for mechanical drawing, three shops for manual training, devoted respectively to wood-work, smith's work, and metal work. The central station would be under his charge, and here light and power would be produced for the whole College. A portion of this central station could be used for the teaching of Thermo-dynamics, and with that object would be fitted up with oil, gas and steam engines (the latter of several types), condenser, air compressor, refrigerator, hydraulic, and other plant. A large Electrical Laboratory, completely equipped, and under the control of an Assistant Professor, would be attached to the Engineering Department. There should also be attached a Laboratory for the practical treatment of the metals after melting or casting, and before reaching the finishing workman's hands. This should contain rolls, wire and tube benches, stamps, steam, ryder, and other kinds of hammers, presses, &c., &c. It would be under the charge of an Instructor, who would teach the flow of metals, and show the correct methods of treating by pressure. There would also be required a Hall of Machines, in which would be placed single specimens of the machine tools, and of the leading machinery used in, and suitable for, the industries of the district. These machines should be of the best and most modern type of English, American, and foreign manufacture. They would not be constantly running, but should be capable of being set in motion from shafting driven by the electric motors, which would be actuated by the current generated in the central station.

The Professor of Engineering would share with the Professor of Metallurgy the use of the Testing Laboratory, which would contain, in addition to the metal testing machines, others for the testing of cement, and apparatus for the measurement of the flow of water over weirs and similar purposes. An Assistant Professor would take charge of the instruction in Civil Engineering, and would require an equipment of surveying instruments, &c.

The Chemical Professor could give the usual courses in Chemistry in the College in Edmund-street, and utilize for these the laboratory now existing, but for the purpose of teaching process Chemistry, another Professor, assisted by an Instructor would be required, and this Professor would need a large laboratory with ample yard space. In this department by the actual use of commercial materials under commercial conditions the scientific methods of carrying out the more important processes such as galvanising, pickling, acid making, the preparation of lacquer, varnishes, &c., &c., would be demonstrated.

All the Professors would require the common use of a Museum and a well-stocked technical library.

In an Appendix to this Report the Committee present a block plan showing the buildings required, their size and their suggested arrangement. These plans suppose a front of two storeys containing the lecture rooms, library, museum, &c., and at the back a series of blocks, all on the ground floor, and intended for the various laboratories and work rooms which have been described. These could be built to provide accommodation in the first instance for 200 day students, increasing afterwards to 500.

The space occupied by these buildings, including the necessary yards and roads, a gymnasium, a director's house, and rooms for a caretaker, is about six acres. In view of the future of the University, a total area of not less than 25 acres should be provided.

The Committee recommend that this land be taken in the outskirts of the city on a main line of, by preference, both rail and road.

They estimate the complete cost as follows:—

	£
25 acres of land and buildings, . .	80,000
Machinery, apparatus, and instruments,	66,000
Fittings, utensils, lighting, and heating,	5,000
Technical library, ...	1,500
Museum, ...	500
Director's house, ...	2,000
Total, ...	£155,000

(Particulars as per Schedule II.)

They estimate the cost of maintenance (including the staff) at £10,450 per annum. (Particulars as per Schedule III.)

They consider that the fees from students for such an education as it is now proposed to give need not be less than £55 per student per annum.

On an estimate of 200 day students only, this would produce an income of £11,000, and leave a surplus of £550.

Some deficiency would have to be provided for during the first years whilst the number of students was growing from the present very small number of about 40, to the very moderate estimate of 200. The cost of that part of the education which is given in the University in Edmund-street also remains to be provided.

The Committee do not advise night classes. They consider that the Technical School either does provide or might provide for the need these classes are intended to meet, and they are sure that the curriculum they propose will absorb all the energies of the teaching staff when employed in the day time only.

To properly carry out the necessary courses, the usual vacations will be considerably shortened and the time of the students more completely occupied. This will not put undue pressure on either the teachers or the students, since a much larger time will be given to workshop and laboratory teaching than is usual, and such teaching will relieve the strain of continuous classroom work. The staff also should give their whole time to the service of the College, and should not be expected to assist their incomes by outside work. On the other hand, the University will have to pay to such a staff higher stipends than at present, and such as will attract the quality of teachers required, and recompense them fairly for the work that the College will demand.

In order to secure the fullest success for the College it will be necessary that the direction of the whole shall be under a single head, who shall see that the various courses are properly co-ordinated and carried out, and give general advice and supervision to students.

Commercial Education.

The Advisory Committee find some difficulty in laying down a course which, being satisfactorily followed, should be recognised by a Diploma, because the principles which underlie the work of a sound man of business are not to be found in any text-book, and the subject has never been codified.

So-called commercial courses are now given in many institutions, and in some Colleges, and these seem to resolve themselves into the teaching of Modern Languages, of what is called Commercial Arithmetic, and of Geography.

Modern Languages, however, should be taught in the very earliest years, when the imitative faculty is strongest and the memory most retentive. Commercial Arithmetic does not go far enough, and this also should have been learnt at school. Geography as a special subject seems very much out of place. Modern journeys are arranged by consultation with one of the touring agencies, and detailed and reliable information as to foreign countries, their imports and their exports, can be best obtained from the annual books of reference and the files of the Imperial Institute.

It seems to the Committee that such a course as detailed above could not do more than make a passable clerk. For the really master man the following appear to your Committee to be the necessary acquirements:—

1. A knowledge of the theory and principles of trade, including the following:—

   The organisation of offices and factories, and the principles underlying the business of making, buying, and selling.

   The theory and principles of trade unions, Associations, trusts, combinations, and rings.

   A knowledge of the chief causes affecting success or failure in business undertakings, with the application of the principles deducible from these to leading modern cases.

2. A general knowledge of commercial law, and of the more usual forms of agreement for work and wages, service, agencies, and buying and selling contracts.

   The law of limited liability companies, including the duties of promoters, directors, secretaries, auditors, and valuers.

3. Sufficient knowledge of accountancy to open a complete set of books for either a merchant's or a manufacturing office, and to prepare trading, profit and loss account, and a balance sheet.

   Also to be able to start a system of cost accounts suitable for any business.
4. A knowledge of shipping and railway practice, rights, and duties, so far as they concern the conveyance of goods.
5. Two modern languages, French being compulsory as one of them, and Spanish, German, or Italian being the second.
6. Shorthand.
7. The theory of banking and exchange.
8. In addition to the lectures and teaching given by the Professor and his assistants, arrangements should be made for lectures to be given by specialists to students in their third year on such subjects, for instance, as Statistics of Imports, Exports and Customs, Rate of Wages, Bounties, Taxes, and other artificial influences on trade.

Such knowledge as the foregoing is what is required in business, and is usually only learnt bit by bit at a heavy cost, so that the man of business has generally reached the limits of his working life before he has completed his commercial education, and owing to the want of a codified system business men continue from generation to generation to renew the mistakes of their predecessors, and to repeat their experiments, and after much tribulation to re-arrive at their methods, their rules, and their conclusions.

To find a Professor to teach some of these subjects thoroughly may be difficult, but it ought to be possible.

Such a teacher might leave the Accountancy to an Assistant Professor, who should himself be a professional accountant, and the Shorthand should be taught by a Shorthand instructor; but the Professor should himself take all the teaching involving the theory and practice of business, and with this object he should make himself acquainted with the literature bearing on the subject at present in existence, and supplement this with consultations with the best business men, making notes of their needs, their rules, and their practice.

He should then bring the whole of his information into methodical form and impart it in lectures to his students.

Students in the Commercial Education Course should not be allowed to enter at too early an age. Twenty is quite early enough, and it would be most desirable that they should have taken a degree in Arts before studying for the Commercial degree, and certainly the highest Commercial degree should only be given to those already in possession of an Arts degree.

Languages, as before stated, should be acquired in early life; in any event the teaching of them should not form part of the Commercial course, though they would form part of the examination for a Commercial Diploma.

Three years should be sufficient for a complete course to be recognised by a diploma; but shorter courses in the following subjects, to be recognised by class certificates, should also be given, and each of these courses would take six months, viz:—

1. A course on the Organization of Factories, including a system of cost accounts, applicable to factories. (This would be very useful to engineers and managers who had taken a technical diploma.)
2. A course on Book-keeping as detailed in paragraph 3.
3. Banking and the theory of Exchanges.

Accommodation.—A lecture room and two class-rooms would be required, as well as accommodation for the Professor, his staff and his students. It is probable that the latter could be found in that already provided for the Technical College; certainly it could for the first few years, and the Committee, in presenting the following estimate, distinguish between the extra cost of lecture rooms and the Commercial College's share of the room provided by the Technical College. The Commercial Faculty would, of course, share with the Technical the use of the library.

	£
Cost.—Building and equipment, . .	6,000
Staff, . . . per anuum,	2,200

(Particulars as per Schedule IV.)

The fees from students might be fixed at £50 per annum, but it is difficult to make any estimate of the income derivable from that source. There is no instance elsewhere of any course at once so complete and so valuable; there is not even, so far as your Committee know, any University in the United Kingdom where there is a separate Faculty of Commerce, and as there has not yet been any effort to treat the subject with the thoroughness now proposed, so there is no means of estimating the extent to which advantage would be taken of such teaching. Your Committee, however, point to the fact that a Faculty of Commerce so organized and based on the actualities of business experience, would at the present moment stand alone, and would, therefore, attract to the Birmingham University all who feel the need of such an education, and would also to a much greater extent create a new demand.

ARTHUR CHAMBERLAIN,
Chairman.

GEO. H. MORLEY,
Secretary.

19th April, 1900.

Appendix to the foregoing Report.

SCHEDULE I.

REPORT of a VISIT to COLLEGES and UNIVERSITIES in the UNITED STATES and CANADA made in November, 1899, on the suggestion of Mr. Carnegie.

The deputation visited the following institutions:—

Massachusetts Institute of Technology, Boston.
The Polytechnic, Worcester.
Harvard University, Cambridge.
McGill University, Montreal.
University of Toronto, Toronto.
Cornell University, Ithaca.
Armour Institute, Chicago.
University of Chicago, Chicago.
Johns Hopkins University, Baltimore.
University of Pennsylvania, Philadelphia.
Columbia University, New York.
Stevens Institute, Hoboken, Jersey City.

Our attention in each institution was confined to the departments of Applied Science, Physics, and Chemistry.

Mr. Carnegie kindly supplied us with a general letter of introduction and with special letters to institutions in the United States. Everywhere within the States and in Canada we met with the greatest kindness. Every facility was afforded to us in inspecting the laboratories and workshops, and the staff willingly gave us their time. We desire here to express our hearty gratitude for our hospitable reception.

GENERAL REMARKS.

Before describing the methods of instruction in the various departments, we shall give some account of the general system of education carried on in the Science Schools.

Almost the whole of the students enter on a full four-year course of instruction with a view to graduation. The student on entrance is required either to pass an examination or to present satisfactory evidence that he is qualified to take up the course on which he enters. The entrance examination is not very different, as a rule, from the Matriculation Examination of the

University of London. It is more advanced in Mathematics, but probably easier on the literary side. In many cases we learned that the standard had been gradually rising, and that there is still an upward tendency. The consequence is that there has been a rise in the age at entrance, which is at some places between eighteen and nineteen, at others still higher.

The fees vary from £30 to £40 per annum in the Colleges we visited. In the west there are State Universities, at which tuition is free, but we did not visit any of these. Where fees are paid there are a certain number of free scholars usually sent by the State or district, but these do not form a large proportion of the students. The students are drawn from all classes, but it must be remembered that there is nothing like the marked gradation of classes which exists in England. We were told that occasionally students take outside work during the summer vacation in order to earn money to pay their fees. The better known institutions draw pupils from all States, and, indeed, from all parts of the world.

The graduation course extends over four years. Each year begins about the middle of September, and extends to the end of June. The working Session ranges between thirty-three and thirty-eight weeks, but outside this there are summer excursion classes, and summer workshop classes, usually of about one month.

The hours of actual attendance at lecture and laboratory are at least thirty per week; but a large amount of home preparation and work is required as well. The student is expected to read up in the text-book the subject matter of the lectures beforehand, the lectures in many cases consisting of exposition and experimental illustration of the text-book. Recitation classes are held in connection with each lecture, in which individual students are questioned on the text-book or lectures, or asked to demonstrate on the blackboard before the rest of the class. The system differs very widely from our system of University lectures without text-books; while our classes for working exercises illustrating the lectures hardly correspond to the Recitation classes.

Notwithstanding the requirements of the entrance examination in literary subjects, a certain amount of time is given by the Science students, especially in the first two years, to what are often called "culture subjects," such as Literature, Composition and Rhetoric, History, Political Economy, French and German.

The work and ability of the students is tested by assigning marks for attendance, success in recitation, excellence of laboratory, and manual work throughout the Session, and by written class examinations conducted by the Professors at the end of the Session. But, generally, the written examination is of very much less importance than with us, sometimes counting for 50 per cent. of the whole, sometimes for less. We even heard of cases of students, unable to attend the examination, who were yet passed on their sessional work alone.

There is nothing like the British system of examination by those who have not themselves taught the students examined. Nor are there laboratory or practical examinations. If a student at the end of the Session fails to pass, he may have the opportunity of reinstating himself by a "postmortem," but if he again fails he drops out of the graduate course.

The right of dismissal at any stage is maintained and used. Any student who shows that he is unable or unwilling to keep up with the work is excluded by the Faculty from the graduation course. He may be allowed to take on special courses, but usually he is dismissed from the institution.

The system has been devised to keep, and succeeds in keeping, the students continuously at work, and the result of the process of exclusion in the earlier stages is that nearly the whole of the final classes are successful in graduating. In the fourth year the last half of the time is usually devoted to the preparation of a "thesis," which consists in the account of an investigation by the student, not necessarily of an original kind. But in some cases the investigations amount to useful original researches. We heard of theses describing running tests of a locomotive, experiments on the laws of slide valve friction, and experiments on the viscosity and friction of lubricants. The theses are bound and preserved in the libraries.

Those who pass successfully through the whole course receive either a Bachelor's Degree or a Diploma, the title differing at different institutions.

A small proportion of the graduates return for post graduate work, and graduates from one institution frequently work as post graduates at another. Such advanced work is encouraged by affording every facility for study and research to the post graduate. A register of graduates is kept and posted from year to year, with the address and occupation of the alumni, although apparently graduates have no voice in the government of the institutions through which they have passed.

The staff may consist of Professors, Assistant Professors, Instructors (corresponding to our Assistant Lecturers and Demonstrators), and Assistants (corresponding to our Junior Demonstrators). The proportion of staff to students may be illustrated by two typical cases. We take first Sibley College, which is the Engineering College in Cornell University, a general University containing literary and scientific departments which provide for the literary and scientific instruction of the Sibley students.

SIBLEY COLLEGE.

No. of Students.	No. of Professors.	Assistant Professors.	Instructors.	Assistants.	Total Staff.
471	6	3	12	12	33

In addition to the Dean there are Professors of Mechanical, of Experimental, and of Electrical Engineering, of Manual Training, and of *Machine Design*.

The other case is that of the Massachusetts Institute of Technology at Boston, primarily a School of Applied Science, which has to provide its own teachers of literary and scientific subjects.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON.

No. of Students.	No. of Professors.	Assistant Professors.	Instructors.	Assistants.	Total Staff.
1,171	23	30	50	33	136

The Professors are to the students, therefore, in the ratio of about 1·80 at Sibley, and 1·50 at Boston, while the whole staff is in the ratio af about 1·14 at Sibley, and 1·9 at Boston.

But the really important question is the proportion of staff to subjects. In America sub-division of subjects and specialisation in teaching is carried on much further than with us. Thus every important branch of Engineering at Boston or Sibley has its own Professor, with perhaps an Assistant Professor, and certainly with Instructors. Such specialisation is no doubt rendered easier by the largeness of the schools, but it was carried out before the schools had grown to their present size.

The lectures are given to the whole of the students of a year in a given subject at the same time, but for manual training, laboratory, and recitation the students are divided into smaller classes of perhaps fifteen or twenty-five. In the manual training classes there is usually one instructor to about twelve students.

We were very much struck with the amount of ground occupied by the Colleges, each building standing in its own grounds, so that it is well lighted on every side. Usually there is a large entrance hall, a fine staircase, and wide corridors leading to class rooms and laboratories. The floor space in the laboratories is generally very much greater than with us. The apparatus, instead of being huddled away in dark corners, is set out and classified as if for exhibition, while the machinery occupies a space worthy of its importance.

Every College possesses a general library with a large reading room, which usually froms a central feature of the group of buildings. Students are allowed to take books home. In addition to the general library there is frequently found a library in each department confined to works bearing on the subjects taught in the department, and amply supplied with current periodicals. The library is in a reading and writing room freely used by the students. Where these departmental libraries exist they are very highly valued.

There is sometimes a well-equipped gymnasium, with an instructor.

The locker and lavatory accommodation is ample, and of better quality than is usual with us.

The University of Pennsylvania, at Philadelphia, possesses in Houston Hall, a fine building given to the University by an old graduate in memory of his son, who was also a graduate. It is a club house for the students, any student becoming a member for two dollars per annum. In the building are reading, billiard and smoking rooms, a lunching room, a gymnasium, a swimming bath, and rooms for College societies. The Hall is entirely and very well managed by the students. It is regarded by the staff as having a most excellent influence on student life.

At many Universities there are halls of residence or dormitories, but residence in these is not compulsory, nor is the discipline in them so strict as in our residential Colleges. A large proportion of the students live in lodgings, which are not under any University control. In some places the so-called secret societies, or Greek letter societies, have club houses in which the members of a society live together.

In concluding these general remarks, we desire to express our admiration alike for the high ideal of scientific education which is the aim in American Universities, and for the enthusiasm in all classes which renders it possible to approach so near that ideal. Everywhere we found evidence that the wealthier citizens realise the importance of University Education, and encourage the Universities by generous gifts, and everywhere, both by teachers and by students, these gifts are being used for higher learning and research.

ACCOUNT OF SOME OF THE COURSES IN APPLIED SCIENCE.

There is an entrance examination, the same for all the graduation courses in Science, comprising, perhaps—

Mathematics (Algebra to the Binomial theorem, Euclid, Trigonometry).
English.
One Foreign Language.
Elementary Mechanics.
Elementary Chemistry.

The subsequent studies vary with the course chosen. We give an account of some of the courses which may not be accurate for any one place, but appears to us to represent the average, from which the divergence is not very wide.

Mechanical and Electrical Engineering.

Mathematics is studied chiefly in the first two years, about five hours a week being devoted to the lectures, and the range includes the Calculus and differential Equations.

Physics lectures are given in the first one or two years, and the laboratory work is about three hours per week for the same time.

Chemistry lectures occupy about the same time as those in Physics, but the laboratory work is usually longer.

In addition, lectures are attended on History, Literature, Government, and French and German, the students acquiring knowledge in both these languages, enabling them to read technical works with ease.

The great feature of American Engineering education is the importance assigned nearly everywhere to manual training. This comprises a very carefully graduated course of exercises extending over the four years, and occupying from five to nine hours per week. It includes:—

Joinery.
Wood Pattern making.
Moulding and Foundry work.
Forging.
Fitting.
Metal Turning and Machine work.

In addition, in many cases a summer vacation class is held, in which the students work continuously in the shops for, say, eight hours a day for four weeks. During this period machines, such as lathes, pumps, and steam engines, are made wholly or in part, and the students are trained in the care of the engines and boilers used for providing power.

The manual training is primarily designed to make the students familiar with the right use of tools and materials, and to make them understand the possibilities of construction. It does not aim at making them skilled workmen. Nevertheless, the skill attained is very surprising, considering the comparatively short time spent in the shops, and we saw strong evidence of the admirable training afforded by the careful gradation of the course.

The number of students working in one shop at a time varies from fifteen to twenty-five. The joiners' shop contains about twenty benches, each fitted with a complete set of wood-working tools. There are also about twenty plain lathes for wood-turning.

The machinery for wood-working is used only by the instructor. It comprises in general a circular saw, a planer, and a band saw. The foundry contains all the usual appliances found in commercial establishments, such as core ovens, a small cupola furnace, for brass pots, cranes, &c. The smiths' shop has generally about twenty fires, together with the necessary anvils, swages, &c. In some cases a trip hammer is in use.

The most important of the shops is naturally the machine shop. It contains from twenty to thirty engine lathes, mainly of from 6 in. to 8 in. centres, and 16 in. swing; but a small number of the lathes were of sufficient size to perform heavy work, both as regard height of centres and swing; there were very few capstan lathes, and no automatic lathes. The further equipment consisted of milling machines, planers, radial drills and shapers.

There was also a well-fitted tool room for the smaller tools, which were taken out on the usual check system.

The shops gave us the impression of being thoroughly practical, and on such a scale that the knowledge acquired there by the student would be of use in his subsequent professional life.

Engineering lectures are given throughout the four years, and cover:—

Kinematics of Machinery.
Descriptive Engineering.
Theory of Heat Engines.
Theory of Hydraulics and Motors.
Strength of Materials.
Machine Design.

Great importance is assigned to Engineering laboratory work, and the whole ground of the Engineering lectures is provided for in the equipment of the laboratories. The machines are large in number and in capacity, so that every student performs experiments on an adequate scale. The work is chiefly pursued in the third and fourth years, and occupies from four to six hours weekly.

The Engineering laboratories have the same type of machinery as is usual with us, but in greater variety and number.

At Boston there is a triple expansion experimental engine of about 150 h.-p., a 100 h.-p. high-speed engine, and several small engines, used for teaching valve setting; a two-stage air compressor, a small ammonia plant for experiments on refrigerating machinery, and ample hydraulic plant for studying the discharge of water through pipes and orifices, and for the discharge over weirs; the testing machines are numerous and of most varied types, ranging from the delicate and exact Emery machine of 300,000 lbs. capacity down to cement testing machines of 1,000 lbs. Great stress is laid on the desirability of making tests on large specimens, and for bending we saw a machine capable of taking in a 25ft. beam.

In some laboratories there are full-size locomotives mounted so that running tests can be made, and special courses are arranged for those who wish to take up the mechanical side of railway practice. Facilities are given by the railroad companies for testing under the conditions of actual running.

Special facilities are afforded by the manufacturers in the neighbourhood of Boston to the students of the Massachusetts Institute for carrying out tests of machinery in the works in a very thorough manner.

Electrical Engineering.

The students in Mechanical Engineering usually take a short course in Electrical Engineering, including dynamo and motor work, both direct and alternating.

Students who are being prepared specially for Electrical Engineering take nearly the same course as Mechanical Engineers, but in the third and fourth year spend less time in the mechanical and more in the electrical laboratory. There is a growing desire to abolish the distinction between the two branches of Engineering.

The Electrical Engineering Laboratories are well fitted with the usual testing plant, together with

dynamos and motors for direct and alternating currents; in the newer laboratories we saw experimental dynamos for illustrating polyphase work.

The machines are larger than is usually the case with us, ranging from 15 to 25 kilowatts; the switch-boards are well arranged, with the connections in view; there is generally a battery of about 100 cells for testing purposes, the current being supplied from the central power station of the College. The equipment in measuring instruments is always large.

Civil Engineering.

The training of Civil Engineers is not so nearly uniform as that of Mechanical Engineers. In some cases the course for the first year is identical with that for Mechanical Engineering, while in others the manual training is entirely omitted, and the courses are sharply differentiated from the first.

In Cornell University, the Civil Engineers form an entirely separate body, and take but few classes in common with the other engineers.

In most institutions the Engineering laboratory work is diminished, and the Civil Engineers substitute geology, surveying, and design of structures. They also give special attention to railroad and highway construction.

The work in Surveying is very thorough, and includes field work throughout the year, together with a summer course. There is usually an extensive stock of theodolites, levels, and chains, so that each student in the field has his own instrument. During the two last years particular attention is devoted to bridge construction, the student preparing complete drawings and stress sheets in accordance with the practice of the leading bridge companies.

Mining Engineering.

Mining students also pursue different courses from the mechanical engineers, manual training and drawing are omitted, their places being taken by surveying and plotting.

The Mining Engineers take up Geology, Mineralogy, and Metallurgy, including the treatment of ores.

There are several mining laboratories equipped on a large scale for the mechanical treatment of the ores of gold, silver, copper, and lead. They have also amalgamating and cyanide plant, and furnaces for the reduction to the metallic state.

The metallurgical laboratory work includes courses in blow-pipe work and assaying.

At Columbia University, New York, there is an excellent collection of section models of mines and a very extensive Mineralogical Museum. Sometimes a summer excursion class is formed to spend some weeks in a mining district where facilities are given to inspect the actual processes of mining.

It may be noted that mining and metallurgy are combined in one course. The metallurgical part of the course is treated as thoroughly as with us, with the exception of iron and steel. These metals are not so fully illustrated in the metallurgical laboratory as some other metals.

Chemistry.

The general laboratory arrangements and the scope of teaching in Chemistry appear to us to be much the same in America as in this country. The laboratories there are as a rule more spacious, and greater facilities are given for research. Electrolytic methods are beginning to be introduced with well devised methods of measurement, and in two laboratories we saw electric furnaces.

At Cornell, where a new building has lately been erected, there is a special laboratory for Physical Chemistry. There is also a small laboratory for teaching Microscopical Chemistry in charge of a teacher who has studied the subject at Delft.

At several Colleges there is a department of Applied Chemistry, through which all students pass who are graduating in Chemistry. The course is short, and generally consists in the production of pure chemicals from commercial articles on a scale in which many kilogrammes are dealt with. The processes are made to resemble, as far as possible, those of manufacturing practice.

At the Massachusetts Institute of Technology, the head of the department was for many years engaged in Chemical Industries, and his students are taught to pay special attention to economy in water, heat, and time. The equipment at the Institute includes:—

Crushing and Foundry Plant.
Rotary Filters.
Small Dyeing Plant.
Drying Chambers.

Courses in "Sanitary Chemistry" are given in many Colleges. They deal with the Chemistry and Bacteriology of air, water, and sewage, and appear to be very similar to courses given here for the Public Health Diploma.

Physics.

The range of teaching in Physics appears to be much the same as in this country. The equipment in apparatus both for lecture and laboratory purposes is, as a rule, carried out on a large scale, and the size of the laboratories allows most of the apparatus to be kept in position, different rooms being used for different subjects. In the more important laboratories many rooms are provided for original research, which is carried on by the staff and post graduate students.

In all cases a small well equipped workshop is attached to the department, where a skilled mechanic is employed solely in the construction and repair of apparatus for the department. A striking instance of the high class of work which can be done in such a workshop is afforded in the construction of Professor Rowland's celebrated Diffraction Gratings. These are ruled in the laboratory by a machine constructed in the physical workshop under Professor Rowland's immediate supervision.

RECOMMENDATIONS.

Mr. Carnegie, in his letter of June 16th, 1899, to Mr. Chamberlain, asks that the deputation shall "report, on their return, what more is necessary to give Birmingham a first-class modern Scientific College, modelled as I have said, after Cornell, not necessarily big, but perfect of its kind." We believe that the system of Engineering education existing at Cornell and other institutions we have visited, and the system of Mining and Metallurgy at Boston and Montreal, all with their four year courses, are admirably planned and carried out. With no great modifications they may be admirably adapted to British requirements. We are convinced that these systems require ample space, much beyond anything which can be obtained on the present site. As we have already pointed out, the essential difference between the American and the British plans consists in the provision in the former of large workshops and spacious laboratories well fitted with appliances for large classes, and in the four years' course, which alone makes the thorough manual training possible.

Considering the Engineering, Mining, and Metallurgy departments, we suggest the acquisition of an ample site on which buildings could be erected on a suitable scale. It would be possible to provide on the ground floor separate shops with their necessary offices for—

Joinery and Pattern Making.
Foundry (Iron and Brass).
Smith's work.
Fitting and Turning (Iron and Brass).
Also Engineering testing and Laboratory (including Hydraulic work).
Steam Laboratory.
Electrical Laboratory.
Metallurgical Laboratory (including plant for treating ores and for illustrating the processes used in the manufacture of brass, copper, &c., such as sheet rolling, tube drawing).

Other portions of the building would be devoted to lecture rooms, drawing rooms, libraries, offices and common rooms.

As an illustration of the way in which the time might be occupied by the students in the Mechanical and Electrical and in the Civil Engineering Courses, we sketch below courses in these departments based on the American model, but containing no literary subjects beyond French and German. It is assumed that the students have previously passed the Matriculation examination of the University.

It is to be noted that no distinction is made between Mechanical and Electrical Engineers in the table, but

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in the fourth year the laboratory work would be differently divided for the two classes of students. The differentiation between Mechanical and Civil Engineers begins in the third year. The lectures in Mathematics, Physics, Chemistry, Geology, French, and German would be taken in University classes, not in special classes for Technical Students.

First Year.

Same for Mechanical, Electrical, and Civil Engineers.

Lectures—

Mathematics,	5 hrs	15 hrs.
Engineering Mechanics,	5 ,,	
Chemistry,	3 ,,	
French or German,	2 ,,	

Laboratories and Shops—

Joinery and Pattern,	6 hrs.	14 hrs.
Drawing,	5 ,,	
Chemistry,	3 ,,	

Occasional visits to works.

Second Year.

Same for Mechanical, Electrical, and Civil Engineers.

Lectures—

Mathematics,	5 hrs.	15 hrs.
Engineering,	5 ,,	
Physics,	3 ,,	
German or French,	2 ,,	

Laboratories and Shops—

Foundry and Forge,	6 hrs.	14 hrs.
Drawing,	5 ,,	
Physics,	3 ,,	

Occasional visits to works.

Third Year.

Mechanical and Electrical Engineers.

Lectures—

Engineering,	6 hrs.	15 hrs.
Electrical Engineering,	2 ,,	
Metallurgy,	2 ,,	
Physics,	3 ,,	
German,	2 ,,	

Laboratory and Shops—

Fitting and Turning,	6 hrs.	14 hrs.
Drawing,	5 ,,	
Electrical Engineering and Metallurgy each half Session,	3 ,,	

Civil Engineers.

Lectures—

Mechanical Engineering,	3 hrs.	14 hrs.
Civil ,,	3 ,,	
Electrical ,,	2 ,,	
Geology,	3 ,,	
Mathematics,	3 ,,	

Laboratory and Shops—

Fitting and Turning,	3 hrs.	15 hrs.
Electrical Laboratory,	3 ,,	
Drawing,	5 ,,	
Surveying,	4 ,,	

Fourth Year.

Lectures—

Engineering,	3 hrs.	6 hrs.
Electrical Engineering,	2 ,,	
Shop Management,	1 ,,	

Laboratory and Shops—

Fitting and Turning,	6 hrs.	24 hrs.
Mechanical and Electrical Laboratory,	12 ,,	
Drawing,	6 ,,	

Lectures—

Civil Engineering,	3 hrs.	6 hrs.
Geology,	3 ,,	

Laboratory and Field—

Surveying,	4 hrs.	25 hrs.
Field Geology,	3 ,,	
Mechanical Laboratory,	6 ,,	
Drawing,	12 ,,	

In the case where Mechanical Engineers intend to specialise in the direction of the manufacture of metals, the time spent in the Mechanical Laboratories would be reduced by one half, practical shop work in the Metallurgical Laboratory being substituted.

Additional workshop practice might be obtained in Summer classes.

GEO. H. KENRICK.
J. H. POYNTING.
F. W. BURSTALL.

December 18th, 1899.

SCHEDULE II.

CAPITAL OUTLAY.

	£	s.	d.	£	s.	d.
Land (25 Acres, at £400),	10,000	0	0			
Buildings (at 6*d.* per cubic foot),	70,000	0	0			
				80,000	0	0
Central Station and Steam Laboratory,	10,000	0	0			
Strength of Materials,	7,000	0	0			
Metallurgy,	7,000	0	0			
Mining,	7,000	0	0			
Electrical,	5,000	0	0			
Iron Working Shop,	2,000	0	0			
Wood Shop,	1,500	0	0			
Foundry,	750	0	0			
Forge,	500	0	0			
Civil Engineering,	1,000	0	0			
Mechanical Treatment of Metals,	7,000	0	0			
Hall of Machinery,	5,000	0	0			
Applied Chemistry,	5,000	0	0			
Fitting Drawing Rooms and Lecture Rooms,	2,000	0	0			
Chimney and Well,	2,000	0	0			
Furnishing Kitchen, Common Room, &c., &c.,	2,750	0	0			
Gymnasium,	500	0	0			
				66,000	0	0
Fittings, Utensils, Lighting and Heating,				5,000	0	0
Technical Library,				1,500	0	0
Museum,				500	0	0
Director's House,				2,000	0	0
				£155,000	0	0

SCHEDULE III.

ANNUAL EXPENDITURE ON STAFF AND MAINTENANCE.

	£	s.	d.	£	s.	d.
Professor of Engineering,	1,000	0	0			
Professor of Mining,	750	0	0			
Professor of Metallurgy,	750	0	0			
Professor of Applied Chemistry,	750	0	0			
				3,250	0	0
Assistant Professor of Civil Engineering,	400	0	0			
Assistant Professor of Mechanical Engineering,	300	0	0			
Assistant Professor of Electrical Engineering,	300	0	0			
				1,000	0	0
Demonstrator in Mining,	150	0	0			
Demonstrator in Metallurgy,	150	0	0			
Demonstrator in Applied Chemistry,	150	0	0			
Demonstrator in Drawing,	150	0	0			
				600	0	0
Instructor in Iron Work,	150	0	0			
Instructor in Wood Work,	150	0	0			
Instructor in Foundry,	150	0	0			
Instructor in Forge,	150	0	0			
				600	0	0
Laboratory Assistant—Electrical,	70	0	0			
Laboratory Assistant—Testing,	70	0	0			
Laboratory Assistant—Metallurgy,	70	0	0			
				210	0	0
Driver,	100	0	0			
Two Stokers,	100	0	0			
				200	0	0
Clerks,				100	0	0
Janitor,				50	0	0
Cleaning,				300	0	0
Rates,				800	0	0
Grants for Working Expenses, Repairs, Coal, &c.,				3,340	0	0
				£10,450	0	0

SCHEDULE IV.

COMMERCIAL FACULTY.

CAPITAL OUTLAY.

	£	s.	d.
Extra Lecture and Class Rooms, with Lighting, Heating and Fittings,	2,000	0	0
Share of accommodation in Technical College, used in common,	3,000	0	0
Books and Apparatus,	1,000	0	0
Total,	£6,000	0	0

STAFF EXPENSES PER ANNUM.

	£	s.	d.
One Professor,	1,200	0	0
One Assistant Professor,	600	0	0
One Instructor,	150	0	0
Fees to Special Lecturers,	250	0	0
Total,	£2,200	0	0

XV.

Letter from J. P. O'Reilly, Esq., formerly Professor of Mineralogy and of Mining at the Royal College of Science for Ireland.

The TEACHING of MINERALOGY in IRELAND.

TO THE PRESIDENT OF THE ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

SIR,—

When, in 1851, as a youth, I proposed to become a civil engineer, there did not exist in Ireland, nor, indeed, in Great Britain, any special school for the adequate teaching of that branch of Applied Science. The usual course at that time in vogue was to become apprenticed to a civil engineer already in practice, paying, consequently a fee, generally high, and involving service as an apprentice for four or five years, as the case might be. Having learned of the "Ecole Centrale des Arts et Manufactures," of Paris, and of its advantages, I entered that School in 1852, after two years' preparation in Paris therefor, and succeeded in passing the three years' obligatory course necessary for the acquirement of a diploma, which was granted me at the conclusion of the final examinations, held in the year 1855. My first engagement as engineer was, at the end of that year with a French Mining Company, formed for the working of the then recently-discovered zinc deposits of the Province of Santander in Northern Spain, where I took up work at the commencement of 1856. I thus became a mining engineer, and had at once occasion to apply, not only my general knowledge of construction as an engineer, but also, very practically, my knowledge of Mineralogy, and, to a certain extent, of Geology. In my second year at the Central School, I had followed the course of Mineralogy and Geology of Burat, an excellent Professor. This course consisted of about sixty lectures of one and a half hours' each. Burat's lectures on Crystallography were necessarily elementary, but excellent, in so far as they were made to depend on the first year's teaching in Descriptive Geometry, which subject was fully and ably taught by Olivier, a known writer on the subject. In Burat's course, Geology was mainly dealt with in its more practical bearings, and his work on the subject may still be consulted with advantage.

I had, therefore, from the outset of my career, to feel my wants in Practical Mineralogy, and to acquire continual experience in that branch of Science. The field opened before me was extended, and of extreme interest, and the ground being, to a considerable extent, new, and but imperfectly known or described. In 1860 I left the Company in the North of Spain, and for some four or five months was engaged with another French company in the working of the sulphate of soda deposits of the valley of the Jarama, not far from Madrid, thus becoming acquainted with a very remarkable mineral formation. I subsequently returned to Dublin, and in 1862-3 published, in collaboration with the late Dr. Sullivan, PH.D., then Professor at the Royal College of Science, Dublin (or, as it was then constituted, Museum of Irish Industry), and also at the Catholic University, a memoir, "Notes on the Mineralogy and Geology of the Province of Santander, N. Spain," and on the deposits of the valley of the Jarama, which appeared in a number of the "Atlantis," for 1862, and was subsequently published in book form in 1863. I subsequently became connected with the General Mining Company of

Ireland, then engaged in working the zinc and lead mines of Silvermines and Shallee, Co. Tipperary, and had thus further occasion of extending my knowledge and of acquiring experience of minerals and of mineralised ground. Finally, in 1869, after some months spent in the North of France, engaged in foundry work, I became a candidate for the Chair of Mineralogy and Mining, then vacant in the recently-instituted College of Science, Stephen's Green, Dublin, and was appointed thereto.

I have thought it useful to thus summarize my experience, as on it I had to found the method and extent of teaching that I proposed to follow for the courses of Mineralogy and Mining with which I became charged. At that time the elementary English works on these subjects were few, and my knowledge of Continental languages enabled me to adopt for the course of Mineralogy Neumann's work, then in repute in Germany, and as his chapters on Crystallography were mainly based on the applications of Descriptive Geometry as regards the development of secondary forms from the fundamental ones of the different systems, and as, moreover, the students having to attend my class had already followed in their first year the course of Descriptive Geometry given with such distinction and fullness by Professor T. F. Pigot, I was enabled to apply to my lectures on Crystallography the simple and elementary methods given in his course, and thus to render comprehensible and relatively clear a branch of Mineralogy which, otherwise treated, may appear to the student extremely complicated, if not confused, and, therefore, repulsive to those who take up the study without any previous preparation or training in Practical or Solid Geometry, as it is frequently called in this country. My course, therefore, came to consist of about twelve to fourteen lectures, with blackboard demonstrations on Crystallography, with practical applications to models and minerals, and about thirty-three lectures on the characteristics of minerals, their modes of determination, and their natural groups. All these lectures were accompanied by the use of both minerals and models as exemplifications. Towards 1880, the Science and Art Department added a practical examination of mineral specimens to the written paper at the examination, usually held at the end of the session, on the subject. To meet this new requirement, and to insure to my class a fair chance of passing the sessional examination satisfactorily, I added to my course a series of about thirty to thirty-three practical demonstrations in Mineralogy, extending over the entire session, thus bringing up the entire course to one consisting of about forty-five lectures and from thirty to thirty-three demonstrations. I should have wished to have been able to extend the course still further, so convinced was I of the importance for the students of their acquiring a certain familiarity with at least a limited range of mineral groups, so as to allow of their having confidence in their judgments when meeting minerals in the field or otherwise. In going thus intimately into what may appear as a merely personal retrospect, I wish to render account of the nature of my experience, to show on what it is founded, and, therefore, to justify my criticism on the conditions attending the teaching of Mineralogy in Ireland at present. As may be seen from the Calendars and Directories, Mineralogy is taught in Trinity College by the Professor holding the Chair of Geology and Mineralogy, a combination of subjects very common all over Europe, both in the Universities and special schools. This combination is that which actually exists at the present time at the Royal College of Science, Dublin, but in the Queen's Colleges of Belfast, Cork, and Galway, Mineralogy appears as a part of the course of "Natural History." Thus, in Belfast College, it forms Part III. of the course of "Natural History" (see Calendar, 1900-1901, p. 77), and is not mentioned in the Index. At Galway College the Calendar states, p. 190, under the heading, "Natural History," "The department of Natural History comprehends the sections of Zoology, Botany, Practical Biology, Geology, Mineralogy, and Physical Geography;" at p. 198, it is stated, "Lectures on Mineralogy, Geology, and Physical Geography are delivered during the first and second terms. The class meets on Mondays, Wednesdays, and Fridays, at 10 o'clock, a.m.," that is, these three subjects are treated of in a course covering about ten weeks, and representing about thirty to thirty-six lectures—about sixty-six lectures altogether—and, presuming that Mineralogy is allowed one-third of these, the subject is seemingly covered in twenty-two lectures, if so much.

At Cork, Mineralogy is comprehended in the course of Natural History, which represents about sixty lectures on Elementary Zoology, about forty on Botany, and a third division, comprehending Physical Geography, Geology and Mineralogy (see Calendar, pp. 57-60), probably fifty to sixty lectures altogether, or pretty much as in Galway. Now, this combination of subjects into a group under the general heading of "Natural History," may have appeared sufficient fifty or one hundred years ago; but, taking into consideration the rapid and vast development of all branches of Science, that may be brought under the heading of "Natural Science," and the specialisation which is becoming more and more imperative, in every branch of study, as well as the higher standard of knowledge that is being required of students, because circumstances have rendered it also imperative, it seems hardly in keeping with the teaching of Modern Science, that such a grouping should be made the subject matter for a single Chair, or that any man should be called on to teach them all with equal and sufficient completeness. That it does not exist practically elsewhere, or only in a few and by no means prominent centres of education, can at once be gathered from the German Scientific Directory, "Minerva," which, mainly intended to bring together the names of the scientific teachers of the world, and the subjects they profess, gives, at the same time, a condensed and summary indication of the natures of the various institutions to which they are attached, and the titles of the Chairs or offices which they fill. Looking over this Directory, and comparing one country with another, Ireland is found to hold a very modest place as regards University and College Education generally, and in, perhaps, not more than half-a-dozen of those therein mentioned, and certainly not among the leading ones, or of those that could be put forward as types of up-to-date education, does the combination of a variety of subjects under the heading, "Natural History," appear. It will be found that almost universally over Europe and the United States, Botany forms a distinct and independent Chair; so also Zoology,—this frequently held concurrently with Comparative Anatomy. Geology and Mineralogy appear very frequently combined in the same Chair; not unfrequently Geology and Palæontology, and sometimes Mineralogy and Petrology (Leipzig).

In the great Universities, such as those of Berlin, Vienna, St. Petersburg, &c., there are distinct Chairs of Mineralogy, and of the other subjects mentioned as grouped in Ireland under the heading or title, "Natural History." Indeed, nothing can be more astonishing than the variety of subjects and Chairs which go to constitute certain of the German, Austrian, French, and Italian Universities, and the total absence of most of these subjects from the Irish teaching centres.

In many of these Universities there are Chairs of Art in its various aspects, Chairs of Descriptive Geometry, which only figures in Ireland in the Royal College of Science, and, seemingly, from the last programme of that institution, is or has disappeared from the subjects appearing on the time table. Need it be pointed out how poorly History, either Ancient or Modern, is represented in this country relatively to the very full manner in which it appears in the lists of Chairs of foreign Universities and Colleges. In, therefore, any new scheme of University Education to be proposed for this country, it would be desirable, and be in accordance with modern views of scientific teaching, that Mineralogy should be assigned a distinct Chair, and that the title cover Crystallography as well. These kindred and closely-connected subjects would thus be allowed that full development which a more comprehensive combination would forbid, or most certainly hinder. This would be all the more appropriate in consideration of the extension which it is proposed to give to Applied Science in the form of Technical Schools and teaching. As the applications of Mineralogy are very numerous in the Arts, and in many cases fundamental, it is rather strange, and marks, in some degree, the neglected state of the teaching of this particular branch of Science here, that its title does not appear in any of the published lists of subjects advertised by the different technical instruction centres of Dublin, nor, indeed, of any other centre of instruction that I know of in Ireland. Taking into account this proposed development of Technical Education in this country, it may be advanced that the subject could, with advantage, be taught within certain limited ranges of practice, in both the Primary and Secondary Schools. It is reasonable and desirable that a child should be made acquainted with the rocks and stones with which he is

daily, so to say, in contact, that he should learn how to distinguish a limestone from a sandstone, a slate rock from a shale, &c. This argument applies still more strongly to the class of students frequenting the Secondary or Intermediate Schools, and implies that they should have access to elementary teaching collections, such as would allow of their becoming familiarized with a range of at least thirty to forty or fifty useful and remarkable minerals. As regards the institutions for higher education and Universities, in which collections are to be found, the teaching of Mineralogy should not be confined simply to students who take up the subject of Geology, but also to those taking up Chemistry (at least, Inorganic) and Physics. A chemist or physicist has continually to deal with problems involving a knowledge of minerals,, indeed, quite as intimately as the geologist, or the miner, or the manufacturer, not to speak of the metallurgist, whose name is hardly known to Higher Science in this country, so far as teaching goes (if the Royal College of Science be excepted). As indicating to a certain extent how limited is the demand for mineralogical instruction in Ireland, it may be pointed out that in Dublin there is not a single shop where mineral specimens for the purpose of study can be purchased; of course, there are shops at which they can be ordered from Edinburgh, Manchester, or London, or, indeed, from Germany, from whence, perhaps, one could get reliable specimens of Irish rocks and minerals with more certainty than in Ireland, or even in Great Britain.

As regards the teaching of Descriptive Geometry, to which I have already alluded in connection with that of Crystallography, it has formed one of the subjects constituting the Chair of Descriptive Geometry and Engineering at the Royal College of Science from its institution in 1869, and it has been the only Chair in Ireland representing it. Yet, as already stated, on the Continent there are very many such Chairs, more particularly in the Schools of Applied Science. In conjunction with Graphic Statics, no more useful branches of Applied Geometry could be taught in our principal scientific institutions and Technical Schools. It is desirable, therefore, that it should receive that full and sufficient recognition which it merits and receives abroad, in the most advanced centres of scientific teaching, by having a Chair allowed to it in any scheme to be put forward for higher education that may be in contemplation for this country.

As the teaching of these branches of Applied Geometry involve a certain amount of draughtmanship, the question of the teaching of Drawing in general, and of Geometrical Drawing in particular, must be taken into consideration. These subjects, as well as that of Art Drawing in general, can hardly be considered as receiving adequate attention, or being sufficiently taught in Ireland. They are in no way represented by Chairs of teaching in any of the higher centres of teaching in the country, and yet the whole trend of modern learning, more particularly that of a historical character, is to lean more and more on Art Drawing, and the best of it, for the ample and complete illustration and explanation of the subject. At this time of day a University can hardly be called a University wherein Art is not distinctly and sufficiently recognised by a Chair or Chairs, representing its different aspects. It is earnestly to be desired, therefore, that full regard will be had to this great want in our education in general, and most particularly in our Elementary School, where the training of the hand and of the eye is, perhaps, more needed for the struggle of life than in the higher degrees of learning.

I have the honour to be, Sir,

Your obedient servant,

J. P. O'REILLY.

XVI.

Correspondence with the Clerk of Convocation of the Royal University of Ireland

(1.)

LETTER from the Secretary of the Royal Commission to the Clerk of Convocation of the Royal University of Ireland.

"ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

Royal University of Ireland,
Earlsfort Terrace,
Dublin,
8th October, 1901.

SIR,

I am directed by the Chairman of the Royal Commission on University Education in Ireland to send you, for the information of Convocation, the accompanying copy of His Majesty's Warrant appointing the Commission, and to say that should Convocation desire to send forward a representative to give evidence on the subject-matter of the Inquiry, the Commission will be glad to make arrangements accordingly.

I am to request that you will be so kind as to bring this matter forward at the next meeting of Convocation, and to inform me of the decision arrived at as soon as practicable.

I am, Sir,
Your obedient Servant,
J. D. DALY,
Secretary.

Charles F. Doyle, Esq., M.A.,
Clerk of Convocation,
Royal University of Ireland,
Dublin."

(2.)

REPLY to foregoing Letter.

"Royal University of Ireland,
Dublin,
October 26th, 1901.

DEAR SIR,

I beg to inform you that I submitted your letter to me of the 8th inst. to the Annual Meeting of Convocation of the Royal University of Ireland, held here on the 24th inst. The invitation to send forward a representative to give evidence on behalf of Convocation before the Royal Commission on University Education in Ireland was discussed at considerable length. As a result, the view of the meeting was that it would be quite impossible to select any person to represent Convocation on a subject about which so many different opinions exist among its members, more particularly as the Charter of the University limits the right of voting to members actually present at a meeting.

I am directed to express to the Commissioners the thanks of Convocation for the invitation given, and to say that for the above reasons there is no course open to Convocation but to decide to take no action in response thereto.

I have the honour to be,
Yours faithfully,
CHARLES F. DOYLE,
Clerk of Convocation.

J. D. Daly, Esq.,
Secretary,
Royal Commission on University
Education in Ireland."

DOCUMENTS, XVII.

XVII.

Letter from Rev. N. M'Auley Brown, D.D., a member of the Senate of the Royal University of Ireland.

Fairy Fort, Limavady,
September 9th, 1901.

GENTLEMEN,

I have hesitated as to whether I should tender myself as a witness before the Royal Commission, and have now decided that I shall not trouble the Commission with my *oral* testimony. At the same time, it is not improbable that the members of the Royal Commission might have a desire to know *what are the views* which *each* and *all* the *Members* of the *Senate* of the *Royal University* hold on the *great* and *important question* of *Irish Education—Higher and Lower*. I, therefore, now, as one of the Senators, hereby put my views on record, in an authoritative and concise form, so that, *in case of such a question arising, my recorded views might be submitted* to the *Royal Commission for what they are worth*.

They are as follows, viz.:—

I have long held, and have never altered my opinion, that the system on which Irish Education was based, at the establishment of Primary Education, is the only fair, equitable, and practical system that can live and thrive in a country like Ireland, where the people are split up into so many religious sects and denominations.

This system has been defined as "UNITED SECULAR AND SEPARATE RELIGIOUS INSTRUCTION," and even in a lengthened experience it cannot be charged *with proselytism* in the smallest degree, or with any other offence, either in the Primary, Intermediate, or Higher Departments. *State Endowments* should be *liberally granted* for *United Secular Instruction* in all the three Departments, from the lowest to the highest; but where any Church or Churches aim at *the teaching* and *propagation* of *their own Sectarian tenets and doctrines*, they should be left to *endow such Denominational Schools, Colleges, and Universities out of their own private funds*.

Even in Roman Catholic countries, Sectarian and Denominational Colleges and Universities have failed to work with success and satisfaction—their Degrees being comparatively worthless; and in all foreign countries, *Denominational Universities have all but disappeared*. Should the British Government be *induced on any grounds whatever* to establish and *endow Sectarian Colleges* or *Universities* in Ireland, they would *thereby waste the public funds;* for such "Foundations" would only be regarded as *Partisan Institutes*; and *their Degrees* would be estimated as of *little or no account, either* in the *British Isles*, or *throughout the world*.

Higher Schools and Colleges should send up students for Degrees in a Non-Sectarian University; and there the attainments of the students should be tested by Extern Examiners; and not by their own teachers acting as Examiners for the Degrees.

These, my opinions on this vexed question, I, *as a Senator of the Royal University now* and *hereby tender*, through the Secretaries of the University, *to the members of the Royal Commission, if they feel disposed to have them read* in *their presence, for what they are worth*.

Very truly yours,
N. M. Brown, D.D., LL.D.,
Senator, R.U.I.

To the Secretaries, R.U.I.

DOCUMENTS, XVIII.

XVIII.

Memorial from certain Roman Catholic Law Students of the Royal University of Ireland.

TO THE MEMBERS OF THE ROYAL COMMISSION ON UNIVERSITY EDUCATION IN IRELAND.

SIRS,—We desire to draw your attention to a grievance affecting certain Catholic students of the Faculty of Law in the Royal University.

By Rules XV. and XVII. of the "Rules of the Honourable Society of King's Inns," one of the conditions for admission to the Irish Bar is attendance for a year at the Law School of a University. For this purpose the Law School of Trinity College, Dublin, is recognised for all students. For graduates of the University of London, University College, London, is similarly recognised. Graduates of the Royal University, attending Cork, Galway, or Belfast Queen's College, are allowed to keep this year in the Law Schools of their respective Colleges.

All efforts, however, which have been made to secure similar privileges for the Catholic Law students attending University College, Dublin, have failed. A projected Law School was refused recognition on the ground of the unofficial character of the College. Hence all Catholic Law students residing in Dublin are obliged to attend lectures at Trinity College, though they are not members of it. This necessity of attendance is, naturally, objected to by students, who do not feel themselves justified in otherwise attending the College.

We beg, therefore, to suggest this as a matter worthy of the consideration of the Commission.

ARTHUR E. CLERY, SCH., B.A., R.U.I.
HUGH KENNEDY, B.A., R.U.I.
JAMES A. MURNAGHAN, B.A., R.U.I.
CORNELIUS LEHANE.
WILLIAM BARRETT.
VINCENT RICE, B.A.

University College,
Stephen's-green, Dublin.
September 19th, 1901.

DOCUMENTS, XIX.

XIX.

Resolution adopted by the Grand Orange Lodge of Ireland.

11th day of December, 1901.

"That this Grand Lodge remains opposed to the endowment by the State of any sectarian University, believing that such an institution is unnecessary, would injuriously affect the higher education of all, would be a source of division rather than peace in a community already too much divided in matters ecclesiastical, would mean the adoption of a system which has been abandoned by every country in which it has been tried, and would be the abandonment of the principle on which legislation in connection with higher education has been based in recent times."

XX.

Returns with reference to the Numbers of Students who passed Examinations in the Royal University of Ireland during the period 1891–1900, from the Queen's Colleges; University College and Catholic University School of Medicine, Dublin; and Magee College, Londonderry.*

* The returns have been compiled from information kindly furnished by the Presidents of the Colleges.—*Secretary.*

DOCUMENTS, XX.

Tables with reference to the Queen's Colleges; University College, and Catholic

QUEEN'S COLLEGE,

RETURN showing the Number of MALE STUDENTS from QUEEN'S COLLEGE, BELFAST, who passed of IRELAND during the period 1891–1900; also the Number

YEAR.	ARTS.															
	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	–	–	–	–	38	9	2	3	26	14	4	3	16	14	3	2	2	2
1892, ...	–	–	–	–	34	10	3	6	31	10	4	3	20	12	3	3	1	3
1893, ...	–	–	–	–	26	8	5	1	21	9	2	3	20	11	2	4	–	5
1894, ...	–	–	–	–	14	8	6	1	32	9	1	3	13	11	2	3	1	2
1895, ...	–	–	–	–	27	9	3	5	29	6	3	2	26	12	6	2	2	2
1896, ...	–	–	–	–	25	9	6	2	30	7	3	1	18	11	5	1	3	5
1897, ...	–	–	–	–	27	9	6	3	30	7	4	1	13	12	7	3	–	–
1898, ...	–	–	–	–	17	10	5	2	24	8	4	3	9	6	3	1	1	2
1899, ...	–	–	–	–	16	8	2	5	21	8	2	1	20	16	4	3	2	3
1900, ...	–	–	–	–	11	6	3	2	21	6	5	–	15	8	4	3	–	3
Total, ...	–	–	–	–	235	86	41	30	265	84	32	20	170	113	39	25	12	27
Average, ...	–	–	–	–	23·5	8·6	4·1	3	26·5	8·4	3·2	2	17	11·3	3·9	2·5	1·2	2·7

YEAR.	LAW.									
	First Law.				LL.B.				LL.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	–	1	–	1	–	1	1	–	–	–
1892, ...	3	3	1	–	1	2	1	1	–	–
1893, ...	–	–	–	–	2	2	1	–	–	–
1894, ...	1	1	–	1	1	–	–	–	–	–
1895, ...	4	2	1	–	2	–	–	–	–	–
1896, ...	1	–	–	–	5	–	–	–	–	–
1897, ...	–	1	1	–	–	–	–	–	–	–
1898, ...	1	–	–	–	2	1	–	1	–	–
1899, ...	–	–	–	–	1	–	–	–	–	–
1900, ...	1	1	1	–	–	–	–	–	2	–
Total, ...	11	9	4	2	14	6	3	2	2	–
Average, ...	1·1	·9	·4	·2	1·4	·6	·3	·2	·2	–

RETURN of MALE STUDENTS attending the various Courses in QUEEN'S COLLEGE, BELFAST,

YEAR.	ARTS.						MEDICINE.					
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.
1891, ...	1	19	140	11	9	180	19	37	164	18	28	266
1892, ...	1	15	129	7	7	159	13	32	155	17	23	240
1893, ...	2	9	118	3	2	134	12	42	149	20	21	244
1894, ...	1	16	107	5	4	133	15	36	119	17	14	201
1895, ...	1	16	102	6	4	129	14	40	134	13	13	214
1896, ...	1	10	92	6	9	118	10	31	139	16	19	215
1897, ...	1	10	93	9	9	122	10	33	133	15	22	213
1898, ...	1	7	88	9	12	117	9	33	125	15	16	198
1899, ...	2	2	87	3	5	99	8	33	134	14	13	202
1900, ...	1	10	68	3	7	89	15	38	138	15	8	214

University School of Medicine, Dublin; and Magee College, Londonderry.

BELFAST—MALE STUDENTS.

Examinations in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY who passed with Honours and who gained Exhibitions.

MEDICINE.																
First Medical.				Second Medical.				Third Medical.				M.B.				M.D.		
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	YEAR.
30	-	-	-	29	1	-	-	29	4	2	1	21	-	-	-	1	-	1891.
39	3	1	1	26	1	1	-	26	2	2	-	13	1	1	-	-	-	1892.
27	4	1	1	39	2	1	1	19	1	-	1	32	2	1	-	1	-	1893.
19	2	-	-	33	-	-	-	26	-	-	-	19	2	2	-	-	-	1894.
16	2	-	-	26	-	-	-	33	-	-	-	18	2	1	1	2	-	1895.
25	3	1	1	20	-	-	-	23	-	-	-	25	2	1	1	-	-	1896.
27	2	1	-	24	1	1	-	14	4	4	-	24	2	1	1	3	-	1897.
23	3	2	-	29	2	2	-	23	2	1	1	18	1	1	-	2	-	1898.
22	2	1	-	29	2	2	-	25	2	2	-	22	2	1	1	1	-	1899.
20	4	1	1	24	2	-	1	29	2	1	1	26	4	2	1	-	-	1900.
248	25	8	4	279	11	7	2	247	17	12	4	218	18	11	5	10	-	Total.
24·8	2·5	·8	·4	27·9	1·1	·7	·2	24·7	1·7	1·2	·4	21·8	1·8	1·1	·5	1	-	Average.

ENGINEERING.													
First Engineering.				Second Engineering.				B.E.				M.E.		
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	YEAR.
1	1	-	-	4	1	1	-	2	-	-	-	-	-	1891.
1	1	1	-	1	-	-	-	4	-	-	-	-	-	1892.
1	1	1	-	2	-	-	-	2	-	-	-	-	-	1893.
-	1	-	1	-	1	-	1	3	-	-	-	-	-	1894.
-	-	-	-	1	2	-	1	-	1	-	1	-	-	1895.
3	2	-	-	1	-	-	-	1	2	1	1	-	-	1896.
1	1	-	-	3	-	-	-	-	-	-	-	-	-	1897.
3	-	-	-	2	1	-	-	2	-	-	-	-	-	1898.
3	-	-	-	4	-	-	-	1	-	-	-	-	-	1899.
2	1	-	1	3	-	-	-	3	2	1	-	-	-	1900.
15	8	2	2	21	5	1	2	18	5	2	2	-	-	Total.
1·5	·8	·2	·2	2·1	·5	·1	·2	1·8	·5	·2	·2	-	-	Average.

during the Ten Years 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.

LAW.						ENGINEERING.							
Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Grand Total.	YEAR.
-	4	10	1	2	17	-	5	7	-	-	12	475	1891.
2	4	15	2	1	24	-	4	7	-	-	11	434	1892.
7	6	15	3	1	32	1	2	3	-	-	6	416	1893.
5	5	13	1	2	26	-	4	7	-	-	11	371	1894.
4	2	13	2	2	23	-	2	6	-	-	8	374	1895.
4	1	11	1	3	20	1	3	10	-	1	15	368	1896.
3	4	13	1	1	22	-	7	6	-	2	15	372	1897.
2	5	6	-	2	15	-	3	10	-	1	14	344	1898.
1	1	7	3	1	13	-	2	9	-	4	15	329	1899.
1	2	4	2	-	9	-	1	9	-	2	12	324	1900.

DOCUMENTS, XX.

QUEEN'S COLLEGE, BELFAST—WOMEN STUDENTS.

RETURN showing the Number of WOMEN STUDENTS from QUEEN'S COLLEGE, BELFAST, who passed Examinations in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY OF IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

ARTS.

YEAR.	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	1	1	1	-	-	-	-	-	2	2	-	-	-	-
1892, ...	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-
1893, ...	-	-	-	-	-	1	-	-	-	-	-	-	1	3	1	1	-	-
1894, ...	-	-	-	-	-	1	-	-	2	-	-	-	3	-	-	-	-	-
1895, ...	-	-	-	-	-	1	-	1	1	1	-	-	1	-	-	-	1	-
1896, ...	-	-	-	-	-	-	-	-	1	1	1	-	2	-	-	-	-	1
1897, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1898, ...	-	-	-	-	-	1	1	-	-	-	-	-	2	-	1	-	-	-
1899, ...	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-
1900, ...	-	-	-	-	3	1	1	-	1	1	1	-	-	1	-	-	-	-
Total, ...	-	-	-	-	4	8	4	1	5	3	2	-	12	7	2	1	2	1
Average, ...	-	-	-	-	·4	·8	·4	·1	·5	·3	·2	-	1·2	·7	·2	·1	·2	·1

MEDICINE.

YEAR	First Medical.				Second Medical.				Third Medical.				M.B.				M.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
1892, ...	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
1893, ...	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-
1894, ...	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
1895, ...	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
1896, ...	1	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-
1897, ...	2	-	-	-	1	-	-	-	3	-	-	-	-	-	-	-	-	-
1898, ...	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
1899, ...	2	-	-	-	4	-	-	-	-	-	-	-	4	-	-	-	-	-
1900, ...	1	-	-	-	1	-	-	-	4	-	-	-	-	-	-	-	-	-
Total, ...	11	-	-	-	9	-	-	-	13	-	-	-	7	-	-	-	-	-
Average, ...	1·1	-	-	-	·9	-	-	-	1·3	-	-	-	·7	-	-	-	-	-

One Woman Student passed the LL.B. Degree Examination with Honours in 1899.

RETURN of WOMEN STUDENTS attending the various Courses in QUEEN'S COLLEGE, BELFAST, during the Ten Years 1891–1900, classified according to RELIGIOUS DENOMINATIONS.

YEAR.	ARTS.						MEDICINE.						LAW.	Grand Total.	YEAR.
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Protestant Episcopalians.		
1891, ...	-	1	-	2	-	3	-	1	3	1	-	5	-	8	1891.
1892, ...	-	3	1	1	-	5	-	-	2	1	-	3	-	8	1892.
1893, ...	-	1	7	1	1	10	-	-	1	2	-	3	-	13	1893.
1894, ...	-	-	1	2	1	4	-	2	6	2	1	11	-	15	1894.
1895, ...	-	1	1	2	-	4	-	2	8	2	2	14	-	18	1895.
1896, ...	-	-	-	-	-	-	-	3	7	1	1	12	-	12	1896.
1897, ...	-	2	-	1	-	3	-	3	6	-	1	10	1	14	1897.
1898, ...	-	2	1	2	-	5	1	1	5	-	2	9	1	15	1898.
1899, ...	-	-	3	1	2	6	1	2	7	-	2	12	-	18	1899.
1900, ...	-	6	14	-	2	22	1	3	7	-	1	12	1	35	1900.

QUEEN'S COLLEGE, CORK—WOMEN STUDENTS.

RETURN showing the Number of WOMEN STUDENTS from QUEEN'S COLLEGE, CORK, who passed Examinations in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY OF IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

YEAR.	ARTS.																	
	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1892, ...	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
1893, ...	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	-	-
1894, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1895, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1896, ...	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
1897, ...	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
1898, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1899, ...	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
1900, ...	-	-	-	-	2	1	-	-	1	-	-	-	-	-	-	-	-	-
Total, ...	-	-	-	-	8	3	-	-	5	-	-	-	1	-	-	-	-	-
Average, ...	-	-	-	-	·8	·3	-	-	·5	-	-	-	·1	-	-	-	-	-

YEAR.	MEDICINE.																	
	First Medical.				Second Medical.				Third Medical.				M.B.				M.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1892, ...	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1893, ...	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1894, ...	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
1895, ...	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
1896, ...	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
1897, ...	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1898, ...	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
1899, ...	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
1900, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total, ...	3	-	-	-	3	-	-	-	2	-	-	-	2	-	-	-	-	-
Average, ...	·3	-	-	-	·3	-	-	-	·2	-	-	-	·2	-	-	-	-	-

No Women Students from Queen's College, Cork, passed Examinations in the Faculties of Law or of Engineering during the period 1891-1900.

RETURN of WOMEN STUDENTS attending the various Courses in QUEEN'S COLLEGE, CORK, during the Ten Years, 1891–1900, classified according to RELIGIOUS DENOMINATIONS.

YEAR.	ARTS.						MEDICINE.						Grand Total.
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	
1891-2, ...	1	1	1	1	-	4	-	1	1	-	-	2	6
1892-3, ...	1	1	-	3	-	5	-	1	1	-	-	2	7
1893-4, ...	1	1	-	3	2	7	-	3	1	1	-	5	12
1894-5, ...	-	1	-	2	1	4	-	1	1	-	-	2	6
1895-6, ...	-	2	1	2	-	5	-	3	1	-	-	4	9
1896-7, ...	-	3	2	-	-	5	-	2	1	-	-	3	8
1897-8, ...	-	3	2	-	-	5	-	1	1	1	-	3	8
1898-9, ...	-	1	2	3	-	6	-	1	-	-	-	1	7
1899-1900, ...	-	3	1	2	-	6	-	1	-	-	-	1	7
1900-1, ...	-	3	1	1	1	6	-	4	-	-	-	4	10

NOTE.—In some of the above named Sessions a Student attended in more than one Faculty.

DOCUMENTS, XX.

QUEEN'S COLLEGE,

RETURN showing the Number of MALE STUDENTS from QUEEN'S COLLEGE, CORK, who passed IRELAND during the period 1891–1900; also the Number

YEAR.	ARTS.															
	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	–	–	–	–	7	3	2	–	7	3	3	–	4	–	–	–	–	–
1892, ...	–	–	–	–	12	1	–	–	8	1	1	–	4	1	–	–	1	1
1893, ...	–	–	–	–	4	3	1	1	10	3	–	–	2	3	2	–	–	–
1894, ...	–	–	–	–	7	–	–	–	4	2	1	1	2	1	1	–	–	–
1895, ...	–	–	–	–	6	–	–	–	6	4	–	1	4	4	2	1	–	–
1896, ...	–	–	–	–	4	1	–	–	4	–	–	–	1	1	1	–	–	1
1897, ...	–	–	–	–	1	1	–	1	7	1	1	–	1	–	–	–	–	–
1898, ...	–	–	–	–	9	–	–	–	5	–	–	–	1	1	1	–	–	–
1899, ...	–	–	–	–	5	–	–	–	7	–	–	–	2	1	1	–	–	–
1900, ...	–	–	–	–	5	–	–	–	6	–	–	–	1	2	2	–	–	–
Total, ...	–	–	–	–	60	9	3	2	64	14	6	2	22	14	10	1	1	2
Average, ...	–	–	–	–	6	·9	·3	·2	6·4	1·4	·6	·2	2·2	1·4	1	·1	·1	·2

YEAR.	LAW.									
	First Law.				LL.B.				LL.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	4	–	–	–	1	1	1	–	–	–
1892, ...	–	–	–	–	–	–	–	–	1	–
1893, ...	1	–	–	–	–	–	–	–	–	–
1894, ...	–	–	–	–	–	–	–	–	–	–
1895, ...	–	–	–	–	–	1	–	1	–	–
1896, ...	–	–	–	–	–	–	–	–	–	–
1897, ...	–	–	–	–	–	–	–	–	–	–
1898, ...	–	–	–	–	–	–	–	–	–	–
1899, ...	–	–	–	–	–	–	–	–	–	–
1900, ...	–	–	–	–	–	–	–	–	–	–
Total, ...	5	–	–	–	1	2	1	1	1	–
Average, ...	·5	–	–	–	·1	·2	·1	·1	·1	–

RETURN of MALE STUDENTS attending the various Courses in QUEEN'S COLLEGE, CORK,

YEAR.	ARTS.						MEDICINE.					
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.
1891-2, ...	23	8	8	3	4	46	134	45	10	6	2	197
1892-3, ...	10	6	8	2	3	29	146	39	7	5	1	198
1893-4, ...	14	12	6	2	3	37	133	43	5	7	2	190
1894-5, ...	6	9	7	1	2	25	112	42	6	8	2	170
1895-6, ...	8	13	6	2	2	31	109	40	5	9	1	164
1896-7, ...	6	11	4	2	3	26	97	49	5	7	3	161
1897-8, ...	10	8	3	4	2	27	81	40	3	7	4	135
1898-9, ...	12	8	2	5	1	28	87	38	4	3	4	136
1899-1900, ...	8	10	1	4	1	24	89	38	1	5	1	134
1900-1, ...	9	8	1	4	2	24	81	41	1	3	–	126

NOTE.—In each of the above Sessions a small number of

CORK—MALE STUDENTS.

Examinations in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY of who passed with Honours and who gained Exhibitions.

MEDICINE.																
First Medical.				Second Medical.				Third Medical.				M.B.				M.D.		YEAR.
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	
17	3	–	–	10	1	1	–	12	–	–	–	14	1	1	–	1	–	1891.
19	4	1	–	10	1	1	–	5	–	–	–	10	–	–	–	–	–	1892.
19	1	–	1	17	1	1	–	14	1	–	1	9	–	–	–	–	–	1893.
23	1	–	–	13	1	–	1	12	1	1	–	7	1	1	–	–	–	1894.
13	2	1	–	18	2	1	1	12	–	–	–	9	1	1	–	–	–	1895.
10	–	–	–	17	–	–	–	17	–	–	–	10	–	–	–	–	–	1896.
10	1	1	–	12	–	–	–	14	–	–	–	15	–	–	–	–	–	1897.
13	–	–	–	8	1	1	–	11	1	1	–	6	3	3	–	–	–	1898.
11	–	–	–	12	–	–	–	7	1	–	1	11	1	1	–	–	–	1899.
8	1	1	–	9	–	–	–	9	1	–	–	10	1	–	1	–	–	1900.
143	13	4	1	126	7	5	2	113	5	2	2	101	8	7	1	1	–	Total.
14·3	1·3	·4	·1	12·6	·7	·5	·2	11·3	·5	·2	·2	10·1	·8	·7	·1	·1	–	Average.

ENGINEERING.														
First Engineering.				Second Engineering.				B.E.				M.E.		YEAR.
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	
2	1	–	–	2	–	–	–	–	–	–	–	–	–	1891.
–	1	–	–	2	–	–	–	2	–	–	–	–	–	1892.
1	–	–	–	2	–	–	–	2	–	–	–	–	–	1893.
2	1	1	–	–	–	–	–	–	–	–	–	–	–	1894.
3	–	–	–	1	2	1	–	–	–	–	–	–	–	1895.
3	–	–	–	2	–	–	–	3	–	–	–	–	–	1896.
1	–	–	–	2	–	–	–	–	–	–	–	–	–	1897.
1	–	–	–	3	–	–	–	–	–	–	–	–	–	1898.
5	–	–	–	–	1	1	–	4	–	–	–	–	–	1899.
4	–	–	–	3	–	–	–	2	1	–	–	–	–	1900.
22	3	1	–	17	3	2	–	13	1	–	–	–	–	Total
2·2	·3	·1	–	1·7	·3	·2	–	1·3	·1	–	–	–	–	Average.

during the Ten Years, 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.

LAW.						ENGINEERING.							
Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Grand Total.	YEAR.
6	–	–	–	–	6	6	9	3	–	1	19	268	1891-2
6	1	–	–	–	7	6	7	2	–	1	16	250	1892-3.
7	3	–	–	–	10	8	6	–	1	2	17	254	1893-4
9	2	–	–	–	11	11	7	1	1	1	21	227	1894-5
6	3	–	–	–	9	6	5	1	1	1	14	218	1895-6.
9	–	–	–	–	9	7	4	1	1	1	14	210	1896-7
6	1	–	–	–	7	7	7	–	1	2	17	186	1897-8.
7	–	–	–	–	7	7	7	–	1	2	17	188	1898-9.
4	1	–	–	–	5	6	7	–	–	2	15	178	1899-1900.
3	1	–	–	–	4	6	9	–	–	2	17	171	1900-1.

Students attended Lectures in more than one Faculty.

DOCUMENTS, XX.

QUEEN'S COLLEGE,

RETURN showing the Number of MALE STUDENTS from QUEEN'S COLLEGE, GALWAY, who passed during the period 1891–1900; also the Number

YEAR.	ARTS.															
	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	1	–	–	–	17	5	2	–	11	1	1	–	7	4	2	1	–	–
1892, ...	–	–	–	–	14	3	–	1	13	3	1	1	6	3	1	–	–	2
1893, ...	–	–	–	–	9	4	2	1	3	5	2	–	4	4	2	1	1	1
1894, ...	1	–	–	–	7	10	4	1	3	9	1	1	2	7	3	–	3	1
1895, ...	1	1	–	–	9	–	–	–	15	–	–	–	4	9	4	1	–	–
1896, ...	–	–	–	–	12	1	–	–	9	2	–	1	5	3	2	–	1	1
1897, ...	–	–	–	–	7	3	1	1	7	5	–	–	6	2	2	–	–	1
1898, ...	2	–	–	–	14	2	–	1	12	–	–	–	4	2	1	–	–	–
1899, ...	–	–	–	–	12	4	1	1	4	4	–	1	6	1	–	1	–	–
1900, ...	3	–	–	–	12	6	3	–	6	4	2	1	2	–	–	–	1	2
Total,*... ...	8	1	–	–	113	38	13	6	83	33	7	5	46	35	17	4	6	8
Average, ...	·8	·1	–	–	11·3	3·8	1·3	·6	8·3	3·3	·7	·5	4·6	3·5	1·7	·4	·6	·8

YEAR.	LAW.									
	First Law.				LL.B.				LL.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	–	–	–	–	–	–	–	–	–	–
1892, ...	–	–	–	–	–	–	–	–	–	–
1893, ...	–	–	–	–	–	–	–	–	–	–
1894, ...	3	–	–	–	–	–	–	–	–	–
1895, ...	–	–	–	–	1	–	–	–	–	–
1896, ...	–	–	–	–	–	–	–	–	–	–
1897, ...	–	–	–	–	–	1	1	–	–	–
1898, ...	–	–	–	–	–	–	–	–	–	–
1899, ...	–	–	–	–	–	–	–	–	–	–
1900, ...	–	–	–	–	–	–	–	–	–	–
Total, ...	3	–	–	–	1	1	1	–	–	–
Average, ...	·3	–	–	–	·1	·1	·1	–	–	–

RETURN of MALE STUDENTS attending the various Courses in QUEEN'S COLLEGE, GALWAY,

YEAR.	ARTS.						MEDICINE.					
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.
1891, ...	12	5	31	5	–	53	19	11	7	1	–	38
1892, ...	16	4	28	2	–	50	19	7	12	2	–	40
1893, ...	12	7	37	3	–	59	23	12	7	3	–	45
1894, ...	15	3	27	3	–	48	20	16	17	–	–	53
1895, ...	15	6	26	1	–	48	20	7	6	–	–	33
1896, ...	18	4	26	–	–	48	18	6	7	–	–	31
1897, ...	15	7	24	1	3	50	15	4	7	2	1	29
1898, ...	12	4	21	4	1	42	14	4	7	2	1	28
1899, ...	21	9	21	3	–	54	21	3	13	1	–	38
1900, ...	17	7	18	4	–	46	14	1	13	1	–	29

* Nearly all Students Matriculate in the Royal University of Ireland before entering here.

GALWAY—MALE STUDENTS.

Examination in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY of IRELAND who passed with Honours and who gained Exhibitions. DOCUMENTS, XX.

MEDICINE.

First Medical.				Second Medical.				Third Medical.				M.B.				M.D.		YEAR.
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	
9	-	-	-	5	-	-	-	3	-	-	-	5	-	-	-	-	-	1891.
7	1	-	-	6	-	-	-	8	-	-	-	1	-	-	-	-	-	1892.
5	3	-	1	4	1	-	-	4	-	-	-	5	-	-	-	-	-	1893.
4	1	1	-	9	-	-	-	5	-	-	-	1	-	-	-	-	-	1894.
5	-	-	-	4	-	-	-	7	-	-	-	6	-	-	-	-	-	1895.
1	2	-	-	6	-	-	-	6	1	1	-	-	-	-	-	1	-	1896.
4	1	-	-	4	-	-	-	4	-	-	-	6	-	-	-	-	-	1897.
2	1	-	1	5	-	-	-	5	-	-	-	6	-	-	-	-	-	1898.
6	-	-	-	2	1	1	-	5	-	-	-	3	-	-	-	-	-	1899.
6	-	-	-	2	-	-	-	3	1	1	-	5	-	-	-	-	-	1900.
49	9	1	2	47	2	1	-	60	2	2	-	38	-	-	-	1	-	Total.
4·9	·9	·1	·2	4·7	·2	·1	-	5	·2	·2	-	3·8	-	-	-	·1	-	Average.

ENGINEERING.

First Engineering.				Second Engineering.				B.E.				M.E.		YEAR.
Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	
3	-	-	-	3	1	1	-	-	-	-	-	-	-	1891.
3	1	-	-	2	-	-	-	-	2	-	1	-	-	1892.
4	2	-	1	3	-	-	-	4	1	1	-	-	-	1893.
5	1	-	-	3	1	2	-	-	-	-	-	-	-	1894.
5	-	-	-	3	-	-	-	3	1	1	-	-	-	1895.
1	2	1	1	4	1	1	-	2	-	-	-	-	-	1896.
1	1	-	-	6	3	1	1	2	2	-	1	-	-	1897.
2	-	-	-	3	-	-	-	5	1	1	-	-	-	1898.
2	-	-	-	1	1	1	-	5	1	1	-	-	-	1899.
1	-	-	-	-	-	-	-	2	1	1	-	-	-	1900.
27	7	1	2	28	7	6	1	23	9	5	2	-	-	Total.
2·7	·7	·1	·2	2·8	·7	·6	·1	·3	·9	·5	·2	-	-	Average.

during the Ten Years 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.†

LAW.						ENGINEERING.							
Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Grand Total.	YEAR.
4	-	1	-	-	5	3	10	8	-	-	21	117	1891.
4	-	4	-	-	8	12	4	8	-	-	24	122	1892.
6	2	-	-	-	8	9	8	5	-	-	22	134	1893.
2	-	2	-	-	4	15	2	8	-	-	25	130	1894.
2	-	2	1	-	5	9	6	6	-	-	21	107	1895.
1	-	3	1	-	5	15	4	8	-	-	27	111	1896.
2	-	4	-	-	6	6	6	3	-	1	16	101	1897.
1	-	-	-	-	1	3	3	6	-	2	14	85	1898.
1	-	2	-	-	3	6	3	6	-	2	17	113	1899.
2	1	-	-	-	3	5	4	10	-	-	19	97	1900.

† In 1891 there were 3 students; in 1893, 1; in 1895, 5; and in 1896, 4 who did not enter for any Faculty, and whose religion is not classified.

DOCUMENTS, XX.

QUEEN'S COLLEGE, GALWAY—WOMEN STUDENTS.

RETURN showing the Number of WOMEN STUDENTS from QUEEN'S COLLEGE, GALWAY, who passed Examinations in the Faculties of Arts, Medicine, Law, and Engineering in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900: also the Number who passed with Honours and who gained Exhibitions.

YEAR.	ARTS.																	
	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1892, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1893, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1894, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1895, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1896, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1897, ...	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–
1898, ...	–	–	–	–	–	–	–	–	–	2	2	–	–	–	–	–	–	–
1899, ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1900	–	–	–	–	–	2	–	–	–	–	–	–	–	2	–	1	–	–
... ...	–	–	–	–	–	4	–	–	–	2	2	–	–	2	–	1	–	–
Average, ...	–	–	–	–	–	·4	–	–	–	·2	·2	–	–	·2	–	·1	–	–

One Woman Student from Queen's College, Galway, passed the First Medical Examination in the Royal University in 1893. No other Examinations in Medicine, and no Examinations in Law or Engineering, were passed by Women Students from this College during the period 1891–1900.

RETURN of WOMEN STUDENTS attending the various Courses in QUEEN'S COLLEGE, GALWAY, during the Ten Years 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.

YEAR.	ARTS.						MEDICINE.						Grand Total.
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.	
1891.	–	–	–	–	–	–	–	–	–	–	–	–	–
1892.	–	–	–	–	–	–	–	–	1	–	–	1	1
1893.	–	–	–	–	–	–	–	–	1	–	–	1	1
1894.	–	–	–	–	–	–	–	–	1	–	–	1	1
1895.	1	1	–	–	–	2	–	–	1	–	–	1	3
1896.	–	–	3	2	–	5	–	–	1	–	–	1	6
1897.	–	–	2	–	–	2	–	–	1	–	–	1	3
1898.	–	1	3	–	–	4	–	–	1	–	–	1	5
1899	1	1	3	1	–	6	–	–	1	–	–	1	7
1900.	2	2	4	2	–	10	–	–	–	–	–	–	10

UNIVERSITY COLLEGE, DUBLIN.

RETURN showing the Number of STUDENTS from UNIVERSITY COLLEGE, DUBLIN, who passed Examinations in the Faculties of Arts, Law, and Engineering, in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

ARTS.

YEAR.	Matriculation.				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibitions.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	10	5	-	2	15	5	2	2	5	12	5	1	13	8	4	-	3	2
1892, ...	10	5	2	-	20	8	3	2	9	7	2	4	6	7	2	3	3	3
1893, ...	10	15	5	6	15	6	2	3	11	10	4	2	7	4	1	1	-	3
1894, ...	5	7	2	1	13	13	5	6	8	7	3	2	3	11	3	3	1	2
1895, ...	12	11	5	4	14	9	5	3	13	16	3	4	3	4	-	2	3	5
1896, ...	14	13	2	2	15	12	3	7	11	11	2	5	10	8	3	4	-	2
1897, ...	8	4	1	2	19	9	2	4	14	10	1	4	5	9	6	2	-	6
1898, ...	16	4	2	1	22	6	3	3	6	10	4	3	7	8	1	5	1	2
1899, ...	9	10	2	2	13	3	1	2	7	7	3	2	8	6	3	2	1	4
1900, ...	11	3	1	1	19	6	3	3	11	4	2	1	9	6	2	2	-	1
Total, ...	105	77	22	21	170	77	29	35	95	94	29	28	71	71	25	24	13	30
Average, ...	10·5	7·7	2·2	2·1	17	7·7	2·9	3·5	9·5	9·4	2·9	2·8	7·1	7·1	2·5	2·4	1·2	3

LAW.

YEAR.	First Law.				LL.B.				LL.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	-	-	-	-	-	-
1892, ...	-	-	-	-	-	-	-	-	-	-
1893, ...	-	-	-	-	-	1	1	-	-	-
1894, ...	1	-	-	-	-	-	-	-	-	-
1895, ...	1	-	-	-	-	-	-	-	-	-
1896, ...	1	-	-	-	1	-	-	-	-	-
1897, ...	-	-	-	-	1	-	-	-	-	-
1898, ...	-	-	-	-	-	1	-	-	-	-
1899, ...	2	1	-	1	-	-	-	-	-	-
1900, ...	1	-	-	-	-	1	-	1	-	-
Total, ...	6	1	-	1	2	3	1	1	-	-
Average, ...	·6	·1	-	·1	·2	·3	·1	·1	-	-

ENGINEERING.

YEAR.	First Engineering.				Second Engineering.				B.E.				M.E.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	2	1	-	-	-	-	-	1	-	-	-	-	-
1892, ...	1	-	-	-	2	1	1	-	-	-	-	-	-	-
1893, ...	1	-	-	-	1	-	-	-	-	-	-	-	-	-
1894, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1895, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1896, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1897, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1898, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1899, ...	2	-	-	-	-	-	-	-	-	-	-	-	-	-
1900, ...	1	-	-	-	-	1	1	-	-	-	-	-	-	-
Total, ...	5	2	1	-	3	2	2	-	1	-	-	-	-	-
Average,	·5	·2	·1	-	·3	·2	·2	-	·1	-	-	-	-	-

NOTE.—A regular record of the religious denominations of the Students for the last ten years has not been kept, but there has been always a certain proportion, say 8 to 10 or 12 per cent., of non-Catholics, Protestants, Presbyterians, Methodists, Jews, amongst them not infrequently being Protestant clergymen.

DOCUMENTS, XX.

CATHOLIC UNIVERSITY SCHOOL OF MEDICINE—MALE STUDENTS.

RETURN showing the Number of MALE STUDENTS from CATHOLIC UNIVERSITY SCHOOL of MEDICINE who passed Examinations in the Faculty of Medicine in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

YEAR.	MEDICINE.															
	First Medical.				Second Medical.				Third Medical.				M.B.				M.D.
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	No Honours given at M.D. Examination.
1891, ...	8	4	1	1	10	-	-	-	10	-	-	-	9	-	-	-	1
1892, ...	20	7	1	-	4	3	1	1	12	-	-	-	12	-	-	-	-
1893, ...	11	5	1	-	17	1	-	1	5	2	2	-	11	1	-	1	*2
1894, ...	11	8	1	3	15	2	2	-	11	-	-	-	6	-	-	-	†1
1895, ...	17	8	2	1	8	1	1	-	16	1	-	1	9	-	-	-	-
1896, ...	8	5	1	1	12	3	2	1	12	-	-	-	9	-	-	-	-
1897, ...	16	4	-	2	8	1	-	1	13	-	-	-	19	-	-	-	†1
1898, ...	11	2	1	-	17	-	-	-	12	1	-	1	7	2	-	-	2
1899, ...	17	2	1	1	7	-	-	-	10	-	-	-	10	-	-	-	2
1900, ...	22	1	-	1	19	3	1	1	13	-	-	-	11	1	-	-	-
Total, ...	141	46	9	10	117	14	7	5	114	4	2	2	103	4	-	1	9
Average	14·1	4·6	·9	·1	11·7	1·4	·7	·5	11·4	·4	·2	·2	10·3	·4	-	·1	·9

* One awarded Gold Medal. † With Gold Medal.

WOMEN STUDENTS.

RETURN showing the Number of WOMEN STUDENTS who passed Examinations in the Faculty of Medicine in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

YEAR.	MEDICINE.																	
	First Medical.				Second Medical.				Third Medical.				M.B.				M.D.	
	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1892, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1893	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1894, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1895,*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1896, ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1897, ...	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
1898, ...	-	-	-	-	2	-	-	-	1	-	-	-	1	-	-	-	-	-
1899, ...	2	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-
1900, ...	3	2	-	1	5	1	-	-	-	-	-	-	1	-	-	-	-	-
Total. ...	6	2	-	1	7	1	-	-	3	-	-	-	4	-	-	-	-	-
Average, ...	·6	·2	-	·1	·7	·1	-	-	·3	-	-	-	·4	-	-	-	-	-

The numbers of Students attending the School during the period 1891-1900 are as follow :—1892-93, 210; 1893-94, 201; 1894-95, 203; 1895-96, 195: 1896-97, 200; 1897-98, 195; 1898-99, 210: 1899-1900, 203; 1900-1, 260.

* Women Students were not admitted to the Classes until 1895. The numbers of Women Students attending the School for the period 1895–1900 are as follow :—1895-96, 2; 1896-97, 5; 1897-98, 5; 1898-99, 5; 1899-1900, 12; 1900-1, 15. No record of Religious Denominations kept.

MAGEE COLLEGE, LONDONDERRY—MALE STUDENTS.

RETURN showing the Number of MALE STUDENTS from MAGEE COLLEGE, LONDONDERRY, who passed Examinations in the Faculties of Arts in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

YEAR.	ARTS.																	
	Matriculation.*				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours.
1891, ...	-	-	-	-	8	-	-	-	4	2	1	1	4	-	-	-	-	-
1892, ...	-	-	-	-	9	-	-	-	3	-	-	-	2	1	-	1	1	1
1893, ...	-	-	-	-	5	1	1	-	6	1	-	-	1	-	-	-	-	-
1894, ...	-	-	-	-	6	3	1	-	6	2	1	-	5	-	-	-	-	-
1895, ...	-	-	-	-	2	1	1	-	2	2	-	-	3	1	1	-	-	-
1896, ...	-	-	-	-	3	1	1	-	4	2	1	-	2	1	1	-	-	-
1897, ...	-	-	-	-	7	-	-	-	2	1	-	-	3	4	3	1	-	-
1898, ...	-	-	-	-	5	1	-	1	-	1	-	-	2	-	-	-	-	1
1899, ...	-	-	-	-	3	-	-	-	5	-	-	-	1	2	2	-	-	-
1900, ...	-	-	-	-	7	-	-	-	8	-	-	-	2	-	-	-	-	1
Total, ...	-	-	-	-	55	7	4	1	40	11	3	1	25	9	7	2	1	3
Average, ...	-	-	-	-	5·5	·7	·4	·1	4	1·1	·3	·1	2·5	·9	·7	·2	·1	·3

* We do not send in any Students for Matriculation.

NOTE.—The majority of our Male Students are candidates for the ministry, and have the option of concluding their course in Arts either by taking a B.A. degree or the Certificate in Arts of the Faculty of Magee College. A considerable number of them do not present themselves at the University Examinations, but avail themselves of the alternative of competing at the Term Examinations of the College and the Examinations for the Certificate in Arts. No Faculties of Medicine, Law, or Engineering in Magee College.—J. R. Leebody.

RETURN of MALE STUDENTS attending the various Courses in MAGEE COLLEGE, LONDONDERRY, during the Ten Years 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.

YEAR.	ARTS.					
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.
1891, ...	1	1	77	-	1	80
1892, ...	-	-	61	-	-	61
1893	-	-	67	-	-	67
1894, ...	-	1	64	-	-	65
1895, ...	-	-	50	-	-	50
1896, ...	-	-	61	-	-	61
1897, ...	-	-	54	-	-	54
1898, ...	-	-	50	1	-	51
1899, ...	-	-	55	-	-	55
1900, ...	-	-	58	-	-	58

DOCUMENTS, XX.

MAGEE COLLEGE, LONDONDERRY—WOMEN STUDENTS.

RETURN showing the Number of WOMEN STUDENTS from MAGEE COLLEGE, LONDONDERRY, who passed Examinations in the Faculty of Arts in the ROYAL UNIVERSITY of IRELAND during the period 1891–1900; also the Number who passed with Honours and who gained Exhibitions.

YEAR	ARTS.															
	Matriculation. *				First University.				Second University.				B.A.				M.A.	
	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours in at least one subject.	Gained 2nd Class Exhibition.	Gained 1st Class Exhibition.	Passed without Honours.	Passed with Honours
1891, ...	-	-	-	-	3	1	-	-	1	1	-	-	2	1	-	1	-	-
1892, ...	-	-	-	-	4	2	-	-	1	1	-	-	2	-	-	-	-	-
1893, ...	-	-	-	-	-	1	-	-	3	2	-	-	1	-	-	-	-	-
1894, ...	-	-	-	-	5	1	-	-	5	-	-	-	1	-	-	-	-	-
1895, ...	-	-	-	-	1	1	1	-	5	-	-	-	4	-	-	-	-	-
1896, ...	-	-	-	-	5	-	-	-	3	1	1	-	-	-	-	-	-	-
1897, ...	-	-	-	-	3	1	-	-	2	2	-	-	3	-	-	-	-	-
1898, ...	-	-	-	-	4	2	-	-	3	1	-	-	1	-	-	-	-	-
1899, ...	-	-	-	-	6	2	-	-	2	1	-	-	-	-	-	-	-	-
1900.	-	-	-	-	1	2	-	1	2	2	-	-	2	-	-	-	-	-
Total, ...	-	-	-	-	32	13	1	1	27	11	1	-	16	1	-	1	-	-
Average, ...	-	-	-	-	3·2	1·3	·1	·1	2·7	1·1	·1	-	1·6	·1	-	·1	-	-

* We do not send in any Students for Matriculation. No Faculties of Medicine, Law, or Engineering in Magee College.

RETURN of WOMEN STUDENTS attending the various Courses in MAGEE COLLEGE, LONDONDERRY, during the Ten Years 1891–1900, classified according to the various RELIGIOUS DENOMINATIONS.

YEAR.	ARTS.					
	Roman Catholics.	Protestant Episcopalians.	Presbyterians.	Methodists.	All other Denominations.	Total.
1891, ...	-	1	14	1	-	16
1892, ...	-	1	14	1	-	16
1893, ...	-	3	8	2	1	14
1894, ...	-	4	12	1	-	17
1895, ...	1	5	6	3	1	16
1896, ...	-	4	7	1	1	13
1897, ...	-	4	9	1	1	15
1898.	-	7	6	-	-	13
1899.	-	5	10	1	1	17
1900, ...	-	7	5	1	-	13

XXI.

Return* showing the Number of Students who Passed the Examinations of the Intermediate Education Board for Ireland in the Year 1900, from Schools receiving Results Fees from the Board.

BOYS.

ROMAN CATHOLICS.						PROTESTANTS.					
Grade.	Leinster.	Munster.	Ulster.	Connaught.	Total.	Grade.	Leinster.	Munster.	Ulster.	Connaught.	Total.
Preparatory, ...	291	294	65	27	677	Preparatory, ...	77	16	71	3	167
Junior, ...	673	579	164	87	1,503	Junior, ...	196	63	261	36	556
Middle, ...	180	165	48	23	416	Middle, ...	80	14	99	15	208
Senior, ...	78	45	23	14	160	Senior, ...	29	4	27	3	63
Total, ...	1,222	1,083	300	151	2,756	Total, ...	382	97	458	57	994

GIRLS.

ROMAN CATHOLICS.						PROTESTANTS.					
Grade.	Leinster.	Munster.	Ulster.	Connaught.	Total.	Grade.	Leinster.	Munster.	Ulster.	Connaught.	Total.
Preparatory, ...	54	45	31	5	135	Preparatory, ...	25	14	56	2	97
Junior, ...	222	123	96	38	479	Junior, ...	79	32	251	20	382
Middle, ...	80	37	20	11	148	Middle, ...	24	8	77	4	113
Senior	44	9	9	2	64	Senior, ...	11	9	42	2	64
Total, ...	400	214	156	56	826	Total, ...	139	63	426	28	656

* This return has been compiled from information kindly furnished by the Principals of the Schools.—*Secretary.*

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DIXON, W. MACNEILE, ESQ., LITT.D., Professor of English Language and Literature, in the University of Birmingham. (*Index to his Evidence.*)

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GARNETT, W., Esq., M.A., D.C.L., Secretary of the Technical Education Board of the London County Council. (*Index to his Evidence.*)

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GONNER, E. C. K., Esq., M.A., Professor of Economic Science, University College, Liverpool. (*Index to his Evidence.*)

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GRAVES, ARNOLD F., ESQ., B.A., Secretary to the Commissioners of Charitable Donations and Bequests for Ireland. (*Index to his Evidence.*)

Is a graduate of Trinity College; was Honorary Secretary of the Dublin Technical School; is Honorary Secretary of the Technical Instruction Committee of the Corporation of Dublin; is also Honorary Secretary of the Pembroke Technical School, and of the Technical Educational Association for Ireland; and is Governor of the Royal Society for the Employment and Training of Women, 5719-27. Want of proper scientific instruction in Ireland, particularly as regards the higher branches; usefulness of a University in providing for the training of Science teachers, 5728, 5739. System of education hitherto prevailing in the country has had the effect of overstocking the professions at the expense of commerce and industry, 5729. Demand for mechanical engineers in Ireland has to be met by the employment of Scotchmen and other outsiders, 5729-31. Usefulness of Technical Education as regards the creation of industries, 5732-34. Superiority of Germany over England in chemical industries due to development of Technical Education in Germany, 5734. Irish industries likely to be benefited by Technical Education, 5732, 5735-38. Science teachers should be trained by the University; question of the manner in which Technical teachers should be trained; training of Science teachers by the College of Science; advisability of including Pedagogy in the course of training, whether in the College of Science or Royal University, 5739-42. Desirability of having a Faculty of Pedagogy, and not merely an examination in the subject, 5743. Question of University Colleges in Dublin utilising the laboratories and teaching in Practical Science of the College of Science as part of the course of University training; this would lead to friction and prove unworkable, 5744-51, 5770-71, 5773-75. Undesirability of having the College of Science under the control of the Department of Agriculture, 5752-61. Alternative proposals: (1) the affiliation of the College of Science to a new teaching University of a non-sectarian character; (2) the establishment of the College as a perfectly autonomous institution, with a governing body of its own, 5762-67. Proposed new faculties in the College; recognition of portion of the teaching in these faculties as qualifying in part for the degrees of the suggested new University desirable, 5768-70. Successful system at Massachusetts Institute of Technology, 5772-73. Want of suitable laboratories for instruction in Applied Science; proposals for providing workshops for Mechanical and Electrical Engineering in Trinity College not carried out through want of funds, 5773. Falling off in number of Engineering students in Ireland due to Colleges teaching Civil Engineering and not Mechanical and Electrical Engineering, 5775. Considerable number of Engineering students of Irish nationality in Owens College, Manchester, 5775. Question of utilising Cork and Galway Queen's Colleges for Technical Education, 5776-79. Value of scientific research; desirability of making provision for it in institutions of University rank, 5780-84. Advisability and feasibility of co-ordinating the teaching of the Training Colleges under the National Education System with that of the University, so as to afford facilities to National School teachers for obtaining a liberal education discussed, 5785-90. Necessity of a liberal education for students intended for industrial life, and of an elementary Science education for every University student, 5790.

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HEATH, R. S., ESQ., M.A., D.SC., Vice-Principal of the University of Birmingham.

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HELLER, W. MAYHOWE, ESQ., B.SC., Head Organiser for Science Instruction under the Board of National Education in Ireland. (*Index to his Evidence.*)

Is B.Sc. of London University, and an Associate of City and Guilds of the London Institute. Previous to present appointment has been Organiser of Science Instruction in London Board Schools, and has been head of the day department of Birmingham Municipal Technical School, 4836-40. Almost utter non-existence of Science teaching in National Schools at time when witness took up his present duties; this state of things mainly due to alterations in regulations of the Department of Science and Art, South Kensington; Science instruction then given in National Schools entirely with a view of earning results' fees, and not for its

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LECKY, RIGHT HON. W. E. H., P.C., Member of Parliament for the University of Dublin. (*Index to his Evidence.*)

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STONEY, G. JOHNSTONE, ESQ., M.A., D.SC., F.R.S., formerly Professor, and afterwards Secretary, of the Queen's University in Ireland. (*Index to his Evidence.*)

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Training of teachers in University of Wales—*Principal Reichel*, 7120.

The establishment of a Register of Teachers of Intermediate Schools in Ireland prevented, owing to the absence of a University in which Roman Catholic teachers could qualify for registration; danger of the country being flooded with teachers from England who were not qualified for registration in England—*Chief Baron Palles*, 6472-79, 6509-10.

Training of teachers in Queen's College, Galway—See under QUEEN'S COLLEGES—*Queen's College, Galway.*

TECHNICAL EDUCATION:

Necessity of establishing a proper system of—*Chief Baron Palles*, 6498-501.

Limits of Technical Education as compared with Liberal Education—*Mr. Blair*, 4646.

General educational value of a hand-and-eye training for all classes of students—*Mr. Bevis*, 4904, 4947-53. Instances of the success of persons so trained in obtaining higher positions in industrial life than those who have not received a training of this kind—*Mr. Bevis*, 4924-29, 4954-64.

Special difficulty of organising technical instruction in Ireland, owing to the absence of existing industries—*Mr. Gill*, 3995. Value of direct instruction in industrial work as a stimulus where industries are non-existent—*Mr. Blair*, 4687, 4724-25.

Utility of Technical Education as a means of creating industries—*Mr. Reynolds*, 4415-20, 4585; *Mr. Graves*, 5732-39.

Industries in Ireland likely to be benefited by Technical Instruction—*Mr. Graves*, 5732, 5735-38.

Industries in Ireland with which existing Technical Schools are concerned—*Mr. Gill*, 3996, 4000.

Special importance of establishing technical departments in centres which draw students from Celtic districts—*Principal Reichel*, 7129-30.

Usefulness of trade schools as part of a system of Technical Education—*Mr. Reynolds*, 4429-31.

Usefulness of day Technical Schools; abolition of the two schools of this kind hitherto existing, regretable—*Mr. Heller*, 4869-74.

The development of such schools by the Intermediate Education Board not probable—*Mr. Heller*, 4874-78.

Co-ordination of Technical Schools and Secondary Schools. See under INTERMEDIATE EDUCATION SYSTEM.

Difference between Technical Schools and Schools of Technology—*Mr. Reynolds*, 4431-33; *Mr. Blair*, 4726-27; *Mr. Stockdale*, 5288.

Advisability of Professors in Technical Colleges keeping in touch with actual present day practice in Engineering, &c.; question of authorising them to engage in consultation work—*Mr. Reynolds*, 4454-55; *Mr. Ogilvie*, 4983, 5003-5; *Mr. Webb*, 6167-68; *Dr. Garnett*, 6286.

Value of highly equipped Technological Colleges—*Mr. Gill*, 3963-64; for training leaders and managers of industries—*Mr. Reynolds*, 4376.

Proper character of higher Technical Colleges as distinct from Universities—*Mr. Heller*, 4879-85.

Desirability of establishing such Colleges in Dublin, Belfast, and Galway—*Mr. Reynolds*, 4423-39.

See also under COLLEGE OF SCIENCE: QUEEN'S COLLEGES.

Co-ordination of Technical and University Education—

Necessity for viewing the education of a country as a whole, when making provision for Technical Education, and of arranging for the co-ordination of the different systems of education—*Mr. Gill*, 3944; *Mr. Reynolds*, 4583-84; *Colonel Plunkett*, 5878-80.

Desirability of having one authority for all forms of education up to the University—*Mr. Reynolds*, 4501, 4532-37; *Mr. Blair*, 4769-89; *Mr. Synnott*, 6814.

Undesirability of affiliating Technical Colleges to Universities; the work of the University of a different character to that of the Technical College—*Mr. Gill*, 4091, 4122, 4173-74; *Mr. Blair*, 4829-33; *Mr. Stockdale*, 5826-27; *Rev. P. J. Dowling*, 5678-712, 5714.

Extent to which a University should include in its curriculum Applied Sciences—*Mr. Ogilvie*, 4994-5003; *Professor M'Clelland*, 5992, 5997-99; *Chief Baron Palles*, 6481, 6543-46; *Right Rev. Monsignor Molloy*, 6627-32; *Vice-Principal Heath*, 6753; *Mr. Synnott*, 6840-41; *Principal Lodge*, 6884, 6942; *Principal Reichel*, 7129; *Dr. Nerincx*, 7409-12.

Possibility of including a system of Technical Education in the University—*Mr. Ogilvie*, 5079-86; *Mr. Webb*, 6102, 6132-43, 6164-65, 6188-91, 6212-18; *Mr. Wertheimer*, 6444.

The question of the desirability of University Colleges utilising the expensive equipments of Technological Colleges by co-ordination of teaching, or by some other arrangements, and of thus avoiding the duplication of these expensive equipments in the University Colleges—*Mr. Reynolds*, 4579-82; *Mr. Ogilvie*, 4992-93; *Mr. Stockdale*, 5327-30; *Rev. P. J. Dowling*, 5700-1, 5702-12; *Professor M'Clelland*, 6000-6, 6015-19; *Principal Lodge*, 6891.

Advantage of establishing relations between Technical Colleges and Universities, so as to enable students of the former to obtain the benefit of University culture and the hall-mark of a University degree—*Mr. Gill*, 4091, 4174; *Mr. Bevis*, 4924-29, 4964-72; *Mr. Ogilvie*, 4983, 5003-5; *Mr. Stockdale*, 5289; *Mr. Graves*, 5790; *Chief Baron Palles*, 6481. The German system of "leaving" certificates in this connection—*Colonel Plunkett*, 5471-77.

The question of the desirability of affording evening students in technical subjects facilities for obtaining University degrees—*Mr. Heller*, 4887-90; *Mr. Werthcimer*, 6448-51; *Vice-Principal Heath*, 6768-70; *Principal Lodge*, 6935-35A.

Danger of detrimental competition between Technical Colleges and University Colleges—*Mr. Reynolds*, 4470-85; *Mr. Ogilvie*, 5049-53, 5059.

Relations between College of Science and proposed teaching University in Dublin. See under COLLEGE OF SCIENCE, DUBLIN.

Relations between Municipal School of Technology, Manchester, and Owens College—See under MANCHESTER: VICTORIA UNIVERSITY.

Relations between Heriot-Watt College and Edinburgh University—See under EDINBURGH.

Relations between Glasgow and West of Scotland Technical College and Glasgow University—See under GLASGOW.

Relations between Technical Colleges and London University—See under LONDON.

Technical Education in Great Britain—

Progress of, in England; Board of Education; funds of; work of; Technical Instruction Committees of County Councils and Boroughs; funds of; work of; mode in which funds are expended; Scholarships—*Mr. Blair*, 4646-52.

Progress of, in Scotland; advantage of administration of all education by one authority; Science and Art programme introduced into Secondary Schools; administration of funds for educational purposes by Scotch Department; Scholarships enabling pupils of Primary Schools to proceed to Secondary Schools, and from latter to Universities—*Mr. Blair*, 4653-63.

Great Britain not behind other countries in Technical Education of the kind given in evening classes, but sufficient training has not been secured for that class of persons who are placed in responsible positions in industrial life at an early age; causes of this deficiency—*Mr. Ogilvie*, 4983; *Colonel Plunkett*, 5974-77.

TECHNICAL EDUCATION—*continued.*

Small extent to which higher Technical Education is appreciated in Great Britain as compared with Germany, shown by statistics—*Mr. Reynolds*, 4584; *Mr. Wertheimer*, 6406-9, 6413; *Principal Lodge*, 6885-86.

Technical Education in Foreign Countries—

Teaching in principal German Technical Schools is of a University standard—*Mr. Reynolds*, 4395-97; *Col. Plunkett*, 5799, 5805-9.

Ages of students in German Technical Colleges; workshop training required in cases of certain class of students in Mechanical Engineering; advisability of making such training compulsory for all such students—*Col. Plunkett*, 5810, 5827-28, 5852-53.

Powers of granting degrees conferred on German Technical Schools—*Mr. Reynolds*, 4387-89; *Col. Plunkett*, 5813-19, 5930-37. Course of study in; duration of; diplomas granted—*Col. Plunkett*, 5811-12.

Mode of appointment of Professors in German Technical Colleges—*Col. Plunkett*, 5878.

Segregation of work of Technical Schools in Germany and United States from that of Universities—*Mr. Reynolds*, 4390-93, 4408-12; *Col. Plunkett*, 5797, 5856-58, 5968-70.

German Technical Colleges under control of the Department of Education—*Col. Plunkett*, 5820-24.

Necessity of requiring students of Technical Colleges to take an Arts course in the University before qualifying for a degree, obviated owing to the high standard of general education given in the German Secondary Schools—*Col. Plunkett*, 5829-35.

Charlottenburg College and Darmstadt College; details as to equipment of; funds of; class of students; courses of study—*Col. Plunkett*, 5836-52; 5884-90.

Value of scientific training of Technical Schools compared with that given by Universities—*Mr. Reynolds*, 4393-96; *Col. Plunkett*, 5825-26.

Post-graduate work in German Technical Schools—*Mr. Reynolds*, 4394-95.

Careers in life for which students of German Technical Schools are trained—*Mr. Reynolds*, 4398.

The idea of bringing promising pupils from Primary Schools, grade by grade, to the University, by means of Bursaries, not favoured in Germany—*Col. Plunkett*, 5883.

Advantages which have been derived in Germany from the development of Technical Education—*Mr. Reynolds*, 4415-18.

Extent to which success of German Technical Colleges is due to efforts of Government; good effect of granting relaxation of military service in cases of students who have passed through Technical Colleges—*Col. Plunkett*, 5955-67.

Polytechnic at Zurich; large development of, on the practical side—*Rev. P. J. Dowling*, 5705-6, 5713.

Technical Departments in Louvain University—*Right Rev. Monsignor Mercier*, 7225-26; *Dr. Nerincx*, 7357-62, 7381-83, 7396, 7406-12.

University at Liège, really a Technical College—*Col. Plunkett*, 5912-14.

Greater development of the Engineering and scientific side in the Technical Schools of United States than in those of Germany—*Mr. Reynolds*, 4404-7.

Diplomas of American Technical Schools—*Mr. Reynolds*, 4413-14.

"Handicraft Schools" in Germany; trades taught; usefulness of, in training superior artisans—*Col. Plunkett*, 5803-4.

Schools of Decorative Art in Germany—*Col. Plunkett*, 5891-93, 5920-29.

Technical instruction in Australia; Technical College in Sidney; smaller State-endowed Colleges exist in almost every town of importance; separation of Technical Education from University Education—*Rev. P. J. Dowling*, 5673-78; *Col. Plunkett*, 5974.

Technical Education in Agricultural subjects—See under AGRICULTURAL EDUCATION.

See also under ARCHITECTURE: BELFAST TECHNICAL INSTITUTE: BIRMINGHAM: BRISTOL: COMMERCIAL EDUCATION: DEPARTMENT OF AGRICULTURE AND TECHNICAL INSTRUCTION FOR IRELAND: INTERMEDIATE EDUCATION SYSTEM: LOUVAIN UNIVERSITY: NATIONAL EDUCATION SYSTEM: QUEEN'S COLLEGES: SCIENTIFIC RESEARCH: TEACHERS: UNIVERSITY OF WALES.

TRINITY COLLEGE, DUBLIN:

Distinction between Trinity College and the University of Dublin—*Dr. Mahaffy*, 7278.

An undenominational institution—*Mr. Lecky*, 6696-97, 6700-4.

Trinity College, although *de jure* undenominational is *de facto* Protestant and non-Catholic—*Mr. Synnott*, 6801.

Facilities afforded for many generations to Roman Catholic students to enter, with fullest guarantee against smallest interference with their religious belief—*Mr. Lecky*, 6677-80, 6711-13.

Relief Bill of 1793—*Mr. Lecky*, 6677-80; *Dr. Starkie*, 6947.

Attitude of Bishop Doyle and Archbishops Murray and Crolly as regards the attendance of Catholic students at—*Dr. Stoney*, 6981-82.

Divinity School of, interferes in no way with students of—*Mr. Lecky*, 6677.

Attitude of the Governing Body with regard to the possibility of Roman Catholics frequenting Trinity College *en masse*—*Mr. Lecky*, 6677; *Mr. Synnott*, 6802, 6832-35.

Attitude of the authorities of, as regards affording Roman Catholic students provision for religious instruction and supervision in the College—*Mr. Lecky*, 6677, 6705-10; *Mr. Synnott*, 6838-39.

Roman Catholic students in—*Mr. Lecky*, 6677.

Attendance of, in Trinity College, not dangerous to their faith if they have been properly instructed in their religion by their parents or clergy—*Dr. Mahaffy*, 7278.

Attitude of Roman Catholic Hierarchy towards—*Mr. Lecky*, 6677.

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UNIVERSITY COLLEGE, DUBLIN:

Effect of the establishment of an adequately endowed new University College in Dublin on the position of—*Right Rev. Monsignor Molloy*, 6624-25.

The adequate endowment of, a solution of the University Question—*Mr. Lecky*, 6677, 6691, 6693, 6697-700, 6711. Would not be a possible solution of the University Question—*Right Rev. Monsignor Molloy*, 6614-17.

UNIVERSITY EDUCATION:

Past History of—

Claim of Earl of Tyrone for a Roman Catholic University in the reign of Queen Elizabeth—*Dr. Mahaffy*, 7278.

Report of School Commission, 1791, recommending "united secular and separate religious education" the first attempt at providing a system free from proselytising tendencies—*Dr. Starkie*, 6947.

Proposal for the erection of a University for Roman Catholics and dissenting Protestants—*Dr. Starkie*, 6947.

Petition of Catholic Bishops in 1793 for authorisation to enable Roman Catholics to endow a College or University—*Dr. Starkie*, 6947.

Relief Bill of 1793 the first real concession to Roman Catholics—*Dr. Starkie*, 6947-52.

Report of Education Commission of 1807 and of Committee of 1825-27 in favour of establishment of schools where the religious belief of the pupils of any denomination would not be interfered with—*Dr. Starkie*, 6947.

Resolutions of Roman Catholic Hierarchy in 1826 countenancing mixed education—*Dr. Starkie*, 6947.

Dr. Doyle's evidence before Parliamentary Committee in 1830; Dr. Crolly's views—*Dr. Starkie*, 6947; *Dr. Stoney*, 6981.

Effects of Catholic Emancipation in stimulating the action of Catholics as regards education;

UNIVERSITY EDUCATION—*continued.*

Dr. Bullen's and Mr. Wyse's measures; advocacy of a second University on the ground that Dublin University was a "mere ecclesiastical" and "anti-national" institution—*Dr. Starkie*, 6947.

Mr. Wyse's scheme of mixed secular and separate religious education for Elementary Schools, and provincial Colleges—*Dr. Starkie*, 6947.

Growth of the feeling of hostility to undenominational education owing to influence of the Roman Curia—*Dr. Starkie*, 6947; *Dr. Stoney*, 6981-86.

Motion of Mr. Wyse in House of Commons for affording the means of higher education to Roman Catholics, by—(1) opening Trinity College, or (2) establishing a Roman Catholic University, or (3) some other adequate methods—leads to Queen's Colleges Scheme—*Dr. Starkie*, 6947.

Repressive effect of the influence of the Roman Catholic Hierarchy on University Education—*Mr. Lecky*, 6677.

Queen's Colleges Scheme—See under QUEEN'S COLLEGES.

Present condition of—

Present provision for higher education of Roman Catholics inadequate—*Chief Baron Palles*, 6472; *Right Rev. Monsignor Molloy*, 6590; *Mr. Synnott*, 6801, 6804.

Lack of higher education among Catholics shown by the slender production of works of merit in Arts, Literature, and Science, and the backward condition of periodical literature in Ireland—*Mr. Synnott*, 6802.

Present provision adequate as regards "quantity" but not as regards "quality"—*Dr. Mahaffy*, 7278, 7280-88, 7315-18.

Present system of undenominational University Education is superior to any system of denominational education, but as it is rejected by Roman Catholics, it is necessary for the State to provide a denominational system—*Mr. Lecky*, 6677.

Disadvantage of making University Education too easily obtainable; analogy from Athens—*Dr. Mahaffy*, 7278.

Professions overstocked in Ireland—*Mr. Synnott*, 6809, 6848.

Advisability of the mixed education of Protestant and Roman Catholic students—*Dr. Stoney*, 6981.

Cambridge and Oxford Tests Acts and Dublin University Tests Act and Regulations show that the Legislature has recognised the necessity of religion accompanying University teaching, and has made it obligatory that these Universities shall continue it, as far as is possible—*Chief Baron Palles*, 6480, 6507-8, 6558-60; *Mr. Lecky*, 6688.

Small number of Roman Catholics in Ireland who receive higher education—*Mr. Lecky*, 6677.

Number of Catholic students who would be likely to avail themselves of University Education in case of the establishment of a University institution acceptable to them—*Right Rev. Monsignor Molloy*, 6595-609; *Mr. Lecky*, 6677; *Mr. Synnott*, 6807, 6809, 6826-31, 6873-77; *Dr. Stoney*, 6986; *Dr. Mahaffy*, 7278, 7286-88.

Percentage of Roman Catholic population apt for University Education compared with the percentage of combined population of Presbyterians and Protestant Episcopalians—*Chief Baron Palles*, 6480; *Right Rev. Monsignor Molloy*, 6601-7; *Mr. Lecky*, 6677.

Number of Roman Catholics who would avail themselves of the proposed new University for Catholics larger than the combined total of Protestant Episcopalians and Presbyterians at present undergoing University training, and likely to increase largely on foundation of the University—*Chief Baron Palles*, 6480.

Number of Roman Catholics apt for University Education hardly likely under the most favourable circumstances to be more than a minority as compared with Protestants—*Mr. Lecky*, 6677.

Opposition of Roman Catholics, Protestant Episcopalians, and Presbyterians to undenominational education exemplified in the history of Primary, Intermediate, and University Education in Ireland—*Chief Baron Palles*, 6480.

Attitude of Roman Catholic Hierarchy and of the Roman Catholic laity towards undenominational or "mixed" education in the past and at present—*Mr. Lecky*, 6677; *Dr. Starkie*, 6947; *Dr. Stoney*, 6981-86.

The absence of a large independent and powerful Catholic gentry and upper middle class a reason for the present objection to undenominational education—*Mr. Lecky*, 6677.

The principle of State endowment of denominational education has already been admitted in elementary education, and in the endowment of Maynooth, and the establishment of the Royal University—*Mr. Synnott*, 6801.

Funds applied to University Education in Ireland derived entirely (except in case of endowment of the Queen's Colleges) from Irish sources—*Mr. Synnott*, 6853-61.

Advisability of effecting the following reforms in the University system:—(1.) The revival of the Queen's University, with provision for post-graduate and research work; (2) the continuance of the Royal University as an examining body, with a prohibition against the taking into account of religious differences in appointing to any of its offices or in conferring any of its distinctions—*Dr. Stoney*, 6988, 6994, 7021-24.

Condition of, in Foreign Countries—

Almost without exception, State-endowed University Education in foreign countries has become secularised and undenominational—*Mr. Lecky*, 6677.

Necessity of taking account of the difference between the conditions of Belgium and Ireland when comparing the University of Louvain with the proposed University in Ireland—*Mr. Synnott*, 6808.

The Roman Catholic claim as stated by Archbishop Cullen has been acceded to, by no Roman Catholic Government in Europe—*Dr. Stoney*, 6982.

See also under LOUVAIN UNIVERSITY.

The Roman Catholic claim—

Nature of the claim made by Catholics—*Chief Baron Palles*, 6472; *Mr. Lecky*, 6677, 6688-700; *Mr. Synnott*, 6801-2; *Dr. Stoney*, 6982; *Dr. Mahaffy*, 7278, 7289-94.

Question of the value of the Declarations of the Roman Catholic laity in 1870 and 1897 as an expression of the real opinion of the laity with respect to University Education—*Chief Baron Palles*, 6472; *Mr. Synnott*, 6808; *Mr. Lecky*, 6677; *Dr. Stoney*, 6986, 6997, 7015; *Dr. Mahaffy*, 7311-24.

Importance of finality—*Mr. Synnott*, 6802; *Dr. Mahaffy*, 7278.

Demand for "equality"—*Chief Baron Palles*, 6472, 6480, 6484; *Mr. Synnott*, 6802, 6852.

Advisability of providing a State endowed system of practically exclusively Roman Catholic education—*Mr. Lecky*, 6677.

Reasons for providing Roman Catholics with the means of higher education:—justice of the claim; detriment to the State arising from the non-settlement of this question; necessity of University provision as an extension of Intermediate Education system; necessity of University training for teachers of Intermediate Schools; necessity of constituting a Register of teachers; exclusion of Catholics from posts of administration in the Government of Ireland owing to lack of education; advisability of providing for the higher education of Roman Catholics in view of the fact that the local administration of Ireland has now passed largely into their hands; the general spread of higher education among Roman Catholics would tend to bring classes closer together, and remove existing religious prejudices—*Chief Baron Palles*, 6472-79; *Right Rev. Monsignor Molloy*, 6608-11, 6591; *Mr. Synnott*, 6801; *Dr. Mahaffy*, 7278.

The endowment of Trinity College and other denominational institutions as Protestant insti-

UNIVERSITY EDUCATION—*continued.*

tutions in past times an argument in favour of the present claim for Roman Catholics—*Mr. Synnott*, 6801; *Dr. Mahaffy*, 7289-94.

Suggested Solutions—

Solution No. 1.

The establishment of a University for Catholics in Dublin—
Chief Baron Palles, 6480, 6493-96; *Right Rev. Monsignor Molloy*, 6623; *Mr. Lecky*, 6677; *Mr. Synnott*, 6804, 6825; *Dr. Stoney*, 6988; *Dr. Mahaffy*, 7278.

Character of the proposed University or College for Catholics—*Chief Baron Palles*, 6480, 6484-86, 6563-64; *Professor Macneile Dixon*, 6791; *Dr. Mahaffy*, 7278, 7333-35.

Constitution and functions of the Visitorial Board of the University for Catholics; Roman Catholic Bishops as members of; authority of latter in deciding questions of doctrine involved in a charge made against a Professor of the University—*Chief Baron Palles*, 6480, 6483, 6528-38, 6574-88.

Mode of deciding a charge involving question of Roman Catholic doctrine made against a Professor of the University for Catholics—*Chief Baron Palles*, 6480; *Right Rev. Monsignor Molloy*, 6675-76.

The appointment of Professors in the University for Catholics; the stability in office of; the teaching of matters contrary to doctrines of the Roman Catholic Church to be prohibited by statute, and, if contumacious, to involve the dismissal of the offending Professor—*Chief Baron Palles*, 6480, 6520-26.

Application of the Tests Act to the University for Catholics—*Chief Baron Palles*, 6480.

Laymen on the Board of Visitors—*Chief Baron Palles*, 6480.

Non-Catholics on the Board of Visitors—*Chief Baron Palles*, 6480.

Extent of the control over the general government of the University which would be exercised by the Bishops—*Chief Baron Palles*, 6540-42.

Governing body of the University for Catholics; constitution of—*Chief Baron Palles*, 6480; *Mr. Synnott*, 6809, 6862-72.

Roman Catholic Bishops on the Governing Body—*Chief Baron Palles*, 6480; *Mr. Synnott*, 6809.

Representation of the affiliated Colleges on—*Chief Baron Palles*, 6480.

Representation of the professoriat on the Governing Body—*Mr. Synnott*, 6809.

Endowment and equipment of the University and College for Catholics—*Chief Baron Palles*, 6480-81; *Right Rev. Monsignor Molloy*, 6612, 6623; *Mr. Lecky*, 6677.

Funds to which Ireland has a special title from which portion of this endowment could be derived—*Chief Baron Palles*, 6480; *Mr. Lecky*, 6677; *Mr. Synnott*, 6809-12.

Teaching in the College of the University; proposed faculties—*Chief Baron Palles*, 6481.

The "old learning" should be fully represented in the teaching of the new College—*Mr. Synnott*, 6809, 6848.

Position of Queen's Colleges, Cork and Galway, under this scheme—*Chief Baron Palles*, 6480; *Mr. Synnott*, 6809.

Advantages of Solution No. 1.

It would ensure finality—*Chief Baron Palles*, 6480, 6502-505.

It would afford an opportunity of affiliating Maynooth College to a University—*Chief Baron Palles*, 6480, 6485.

The development of the University would be altogether in the hands of the Roman Catholics, and would not be hampered by outside interference—*Chief Baron Palles*, 6480, 6484.

Objections to Solution No. 1.

The education given would not be as good as that to be obtained under the mixed system—*Mr. Lecky*, 6677; *Dr. Stoney*, 6986.

The danger of one University underselling the others—*Dr. Mahaffy*, 7278.

The danger of the "atmosphere" of the University becoming dangerous to Catholic students

UNIVERSITY EDUCATION—*continued.*

owing to influx of Protestant students—*Dr. Mahaffy*, 7278.

It would strengthen clerical influence in Ireland—*Dr. Stoney*, 6986, 7017.

Disadvantages of Solution No. 1 *as compared with a Solution providing for the establishment of a College for Catholics affiliated to Dublin University*—

Difficulty of arranging for women students—*Mr. Synnott*, 6809.

The degrees of the University would not have the same value as those of the University of Dublin, especially in the case of students leaving Ireland—*Mr. Synnott*, 6804.

The advantages and prestige of Dublin University would be lost—*Mr. Synnott*, 6804.

Success of an Arts course in the proposed University doubtful owing to lack of students—*Mr. Synnott*, 6807.

Small experience of the working of a University which Catholics at present have, makes it desirable that the experience and teaching power of others should be availed of—*Mr. Synnott*, 6807.

Similar demands for denominational education might be made by Protestant Episcopalians and Presbyterians, which might make it difficult for Parliament to carry out the scheme—*Mr. Synnott*, 6808.

The intercourse of Protestant and Catholic students would be more difficult—*Mr. Synnott*, 6807.

The necessity for the establishment of two Universities in Dublin under this scheme; the undue multiplication of Universities undesirable on account of tendency to lower the standard—*Mr. Synnott*, 6807, 6826-31, 6873-75.

The duplication of expensive equipments would be required, which, in case of the establishment of a College for Catholics in Dublin University, would be avoided—*Mr. Synnott*, 6807.

Position of Queen's College, Belfast, in case of the establishment of a University for Catholics in Dublin—*Chief Baron Palles*, 6481.

Solution No. 2.

The establishment of an endowed College for Catholics in connection with the Royal University—
Professor Gonner, 5628-31; *Chief Baron Palles*, 6480; *Right Rev. Monsignor Molloy*, 6614-17, 6623; *Mr. Lecky*, 6677; *Mr. Synnott*, 6804; *Dr. Mahaffy*, 7329-33.

Advantages of Solution No. 2.

The examinations of the University would be a test of the efficient teaching of the Colleges—*Mr. Lecky*, 6677.

The degrees given by a University where students of all denominations compete, would meet with more recognition than those of a purely sectarian body—*Mr. Lecky*, 6677.

Objections to Solution No. 2.

It lacks finality—*Chief Baron Palles*, 6480; *Mr. Synnott*, 6804.

It affords no opportunity of affiliating Maynooth College to the University—*Chief Baron Palles*, 6480.

It would merely be a system of examination—*Mr. Synnott*, 6804.

Unsuitability of Ireland for a federal University—*Professor Gonner*, 5627, 5638.

The successful development of the College would be hampered by the interference of the Senate of a University administered on principles the direct opposite to those of the College, or else the present constitution of the University should be altered; the latter alternative it would be very difficult to effect—*Chief Baron Palles*, 6480, 6487-90, 6492.

Affiliation of Colleges hundreds of miles apart undesirable—*Mr. Synnott*, 6804.

Owing to competition between the constituent Colleges, a too great importance would be attached to examinations—*Right Rev. Monsignor Molloy*, 6623.

There would be no endowment for research—*Mr. Synnott*, 6804.

UNIVERSITY EDUCATION—*continued.*

There would be no University professoriat—*Mr. Synnott*, 6804.

University Professors are prevented from giving their best work to the Colleges, and are reduced to little more than a body of College "guides"—*Right Rev. Monsignor Molloy*, 6623.

Other Suggested Solutions.

(*a.*) *The foundation of an Endowed College for Catholics within the University of Dublin—Chief Baron Palles*, 6480, 6561-64; *Right Rev. Monsignor Molloy*, 6623; *Mr. Lecky*, 6711-12, 6804-7; *Mr. Synnott*, 6804-9, 6821-25.

The ideal solution, because: (1) it would bring together students of all religious denominations; (2) it would afford to all Irishmen a title to the prestige of Dublin University; (3) it would be the most effective method of keeping up to a high standard the level of University Education in Ireland—*Chief Baron Palles*, 6480, 6487, 6494-96, 6505-6.

Views of Roman Catholic clergy and laity as to advisability of a solution which would enable them to participate in the advantages and prestige of Dublin University—*Mr. Synnott*, 6808-9.

(*b.*) *The frequentation en masse of Trinity College, Dublin, by Catholics, the constitution of the College to be altered so as to give Catholics adequate representation on the Governing Board; provision also to be made for definite Catholic dogmatic teaching and religious observances within the College—Mr. Synnott*, 6802, 6833-37.

Not practicable as:—(1.) It is not acceptable to a large mass of Protestants, and probably to many of the Governing Body of Trinity College, Dublin. (2.) The authorities of Trinity College, Dublin, refuse to alter their system of government and give adequate representation to Catholics and *query*, to allow Catholic religious services in the College. (3.) Such a scheme would be unsuitable for Catholic *Clerical* students. (4.) Without large extension of premises and buildings, Trinity College, Dublin, as it stands, would not admit of large influx of *residential* students, and without unanimity and co-operation the necessary funds and endowment could not be obtained—*Mr. Synnott*, 6802-4, 6838-39.

(*c.*) *The establishment of one University with several affiliated Colleges, inclusive or exclusive of Trinity College, Dublin—Dr. Mahaffy*, 7278, 7319, 7329-38.

Relations between the Colleges and the University; autonomy of the Colleges; Board of Curators, with supervisory powers over the Colleges—*Dr. Mahaffy*, 7278, 7307-11, 7320-28.

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APPENDIX

TO THE

FINAL REPORT.

DOCUMENTS.

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